FORESTRY
ECONOMIC & REGIONAL DEVELOPMENT AGREEMENT

FORÊT
ENTENTE DE DÉVELOPPEMENT ÉCONOMIQUE ET RÉGIONAL

Canada

Manitoba

The Canada-Manitoba Forest Renewal Agreement is funded equally by the governments of Canada and Manitoba, from April 1, 1984 to March 31, 1989.

Its primary objectives are to assist in the development and maintenance of timber supplies sufficient to ensure the long-term viability of the forest industry in Manitoba; to promote the efficient utilization of the forest resource in Manitoba; and to contribute to the economic development of the Manitoba forestry sector.

The Agreement comprises four programs: Forest Renewal; Intensive Forest management; Applied Research, Technology Transfer and Opportunity Identification; and Public information, evaluation and administration. These programs are managed by a joint Directorate and are implemented by the Canadian Forestry Service and the Manitoba Forestry Branch.

L'Entente Canada-Manitoba sur la mise en valeur des ressources forestières est financée à parts egales par les gouvernements du Canada et de Manitoba, et a cours du ler avril 1984 au 31 mars 1989.

Ses objectifs principaux sont favoriser le développement et le maintien de l'approvisionnement en bois afin de répondre aux besoins a long terme de l'industrie forestière du Manitoba's; promouvoir l'utilisation rationnelle des ressources forestières du Manitoba; et contribuer à la croissance économique du secteur forestier du Manitoba.

L'Entente comprend quatre programmes: Renouvellement forestier; Aménagement forestier intensif; Recherche appliquées, transfert de connaissances techniques, et détermination des possibilitiés; et administration, information du public et évaluation. Les programmes sont gérés par un Bureau de direction conjoint, et mis en oeuvre par le Service canadien des forêts et le Service forestier du Manitoba.

For more information, please call or write:

Pour de plus amples informations, veuillez vous adresser à:

Canadian Forestry Service
Manitoba District Office
104 - 180 Main Street
Winnipeg, Manitoba
R3C 1A6
Telephone: (204) 949-4817
Attention: J. McQueen

OR/OU

Manitoba Natural Resources
Forestry Branch
300 - 530 Kenaston Blvd.
Winnipeg, Manitoba
R3N 1Z4
Telephone: (204) 945-7866
Attention: G. Munro

FOREST ECOSYSTEM CLASSIFICATION
AND
LAND SYSTEM MAPPING PILOT PROJECT
DUCK MOUNTAIN, MANITOBA

Prepared for

CANADIAN FORESTRY SERVICE
(Dr. I.G.W. Corns - Scientific Authority)

and

MANITOBA FORESTRY BRANCH
Manitoba Department of Natural Resources

under

SUPPLY AND SERVICES CANADA
Contract No. 01K45-7-0031

Prepared by:

PEDOCAN LAND EVALUATION LTD. (EDMONTON)
L. J. Knapik
W. B. Russell
K. M. Riddell
N. Stevens

July 1988

7230.2

90-06243/3

TABLE OF CONTENTS

Page

1. INTRODUCTION . . . 1
1.1 Project Background . . . 1
1.2 Terms of Reference . . . 1

2. CLASSIFICATION AND MAPPING CONCEPTS . . . 3
2.1 Basic Concepts Defined . . . 3
2.2 Classification and Mapping Guidelines . . . 4
2.3 The Proposed Classification and Mapping System . . . 6
2.3.1 Land System Mapping of Duck Mountain Pilot Area . . . 6
2.3.2 Forest Ecosystem Classification . . . 8

3. METHODS . . . 11
3.1 Field Sampling . . . 11
3.2 Soil Laboratory Analyses . . . 21
3.3 Site Productivity Analysis . . . 22
3.3.1 Determination of MAI . . . 23
3.3.2 Determination of SI . . . 23
3.3.3 Analyses of Continuous Independent Variables . . . 24
3.3.4 Analysis of Discrete Variables . . . 24

4. LAND SYSTEMS . . . 25
4.1 Duck Mountain Subregion . . . 25
4.2 Swan River Plain Subregion . . . 28
4.3 Duck Mountain Escarpment Subregion . . . 31

5. FOREST ECOSYSTEMS OF THE PILOT AREA . . . 32
5.1 Forest Ecosystems of the Boreal Mixedwood Ecoregion . . . 33
5.1.1 Key to the Forest Ecosystems of the Boreal Mixedwood . . . 33
5.1.2 Key to the Soils of the Boreal Mixedwood . . . 34
5.1.3 Moisture and Nutrient Regime Classification of the Boreal Mixedwood Ecosystems . . . 35
5.2 Forest Ecosystems of the Mid-Boreal Lowlands . . . 62
5.2.1 Key to the Forest Ecosystems of the Mid-Boreal Lowlands . . . 62
5.2.2 Key to the Soils of the Mid-Boreal Lowlands . . . 63
5.2.3 Moisture and Nutrient Regime Classification of the Mid-Boreal Lowlands Ecosystems . . . 64

6. FOREST MANAGEMENT AND PRODUCTIVITY . . . 101
6.1 Management Interpretations . . . 101
6.2 Site/Productivity Relationships . . . 109
6.2.1 Overall Results . . . 109
6.2.2 Class Means for Discrete Variables . . . 111
6.2.3 Discussion . . . 124

7. REFERENCES . . . 127

APPENDICES

I. Key to the Forest Ecosystems . . . A1
II. Vegetation Data . . . A5
III. Site Data . . . A36
IV. Soil Lab Data . . . A67
V. List of Plant Species . . . A83

TABLE OF CONTENTS (Concluded)

Page

LIST OF FIGURES

1. Guide to slope type and site position 14
2. Instructional diagram for determining soil texture by feel 15
3. Soil drainage 16
4. Ecozones and Ecoregions - Prairie Provinces 26
5. Ecoregions and Habitat (Forest) Subregions of Duck Mountain and surrounding area 27
6. A portion of the Duck Mountain Subregion Land Systems Map and Legend 28
7. A portion of the Swan River Subregion Land Systems Map and Legend 30

LIST OF TABLES

1. Ecological moisture regime classes 17
2. Nutrient regime characteristics 18
3. Soil mineral horizon and modifier descriptions 19
4. Forest humus horizons and humus types 20
5. Methods of soil analysis 21
6. Variables Used in the Study 22
7. Optimum season of harvest 102
8. Site preparation intensity 103
9. Soil compaction hazard 105
10. Soil water erosion hazard 106
11. Reforestation method of cut blocks 107
12. Summary Statistics on SI and MAI 109
13. Significance of F Statistic for SI and MAI 110
14. Mean Productivity Values by Aspect 112
15. Mean Productivity Values by Macro Slope Position 112
16. Mean Productivity Values by Meso Slope Position 113
17. Mean Productivity Values by Ecological Moisture Regime 115
18. Mean Productivity Values by Ecological Nutrient Regime 115
19. Mean Productivity Values by Soil Series 117
20. Significant Differences for Softwood SI by Soil Series 118
21. Significant Differences for MAI by Soil Series 119
22. Mean Productivity Values by Plant Association 120
23. Significant Differences for Softwood SI by Plant Association 121
24. Significant Differences in MAI by Plant Association 122
25. Mean Productivity Values by Ecoregion 123
26. Mean Productivity Values by Soil Type 123
27. Impact of Covariates on Softwood SI 125
28. Site Productivity and Moisture and Nutrient Regimes 125

1. INTRODUCTION

1.1 PROJECT BACKGROUND

The development of a forest management site classification and mapping system for Manitoba is funded by the Canada-Manitoba Forest Renewal Agreement. Funding comes equally from the governments of Canada and Manitoba.

The site classification and mapping system development program is managed and implemented by the Canadian Forest Service (Ian Corns - Edmonton) and the Manitoba Forestry Branch (Jerry Becker - Winnipeg). The program has been implemented in two phases. Phase I, "Development of a Methodology and Rationale for a Forest Management Site Classification System for Manitoba" was conducted by R.E. Wells (1987) under a Supply and Services Canada contract. This work involved review of several site classification schemes and a survey of users needs; and recommended a multifactor mapping approach. Phase II involves the application of site classification and land mapping approaches in two pilot project areas. The Duck Mountain Pilot Project (the subject of this report) was conducted in 1987-88, and the Sandilands Pilot Project will be conducted in 1988-89 by Pedocan Land Evaluation Ltd. under a Supply and Services Canada contract.

1.2 TERMS OF REFERENCE

The primary objectives of the Duck Mountain Pilot Project were identified under Supply and Services Canada contract 01K45-7-0031. The Statement of Work can be summarized as follows:

1. To be familiar with the present MFB site classification system and other potentially applicable studies.

2. To classify the pilot area within the Ecoregions-Subregions of Adams (1985).

3. To map ecological site units at 1:50,000 scale based upon landforms, soils, plant community types, etc. Sample plots to be described after Walmsley et al. (1980).

4. To characterize map units by productivity estimates of site index (SI) and mean annual increment (MAI) of dominant and sub-dominant site types within map units using MFB cruise and permanent sample plot data.

5. To classify and describe the various forest ecosystems.

6. To develop keys to the site units for field use by operational foresters and forestry technicians.

7. To traverse a wide variety of sites with experienced MFB personnel and record successes and failures of various forest management activities.

8. To categorize management interpretations, particularly those related to reforestation silviculture by site type/map unit.

9. To develop additional qualitative interpretations for site and map units.

10. To develop empirical relationships between SI, MAI, and site factors using stepwise multiple regression or other appropriate multivariate statistical methods. Identify key site factors that can be interpreted from air photos and help in defining ecological map unit concepts.

11. To prepare site map on 1:50,000 base map for digitization by MFB into GIS.

12. To prepare interim and final reports and maps.

2. CLASSIFICATION AND MAPPING CONCEPTS

2.1 BASIC CONCEPTS DEFINED

The separate and distinct concepts of forest site classification and forest land mapping must be appreciated. Classification is the creation and definition of classes. Classes are groups of individuals with common properties or relationships that are seen to be similar for a particular purpose. Classes can be formed by grouping individuals or by subdividing populations. Four general types of classification systems (soil, terrain, site and land) have traditionally been applied to forest land (Valentine, 1986). The classes or categories in such classification systems are usually structured hierarchically - that is narrowly defined classes can be grouped into more general classes.

Mapping is the delineation and description of different portions of a land area. It may be accomplished by grouping small areas that are similar, or by dividing an area into portions that are different, or (usually) by a combination of these techniques. Mapping is actually a form of classification, but it identifies the location and pattern of the classes (or map units) in a landscape. There are three basic reasons to classify and map the forest land base:

1. More precise statements can be made about the subdivisions of a region than can be made about the region as a whole.

2. More general statements can be made about a group of types than can be made about an individual type within the group.

3. We can use a short name or number to refer to a type without listing all of its properties.

For further background reading on forest land classification and mapping the reader is referred to an excellent Canadian textbook by Valentine (1986).

2.2 CLASSIFICATION AND MAPPING GUIDELINES

The contract terms of reference provided the general guidelines to:

1. Classify the pilot area within the Ecoregions-Subregions concepts of Adams (1985), and

2. Map ecological site units at 1:50,000 scale based upon landforms, soils, plant communities, etc.

Phase I of this program (Development of a Methodology and Rationale for a Forest Management Site Classification System for Manitoba) provided very general recommendations for an approach such as:

> "An ecological mapping - site classification approach using modern methods of data analysis is therefore recommended as the best available method to achieve a unified site classification framework for solving major site-related forestry programs in Manitoba."
>
> (Wells, 1987; p. 82)

"The "Recommended Methodology" to be followed was as follows:

1. Selection of priority areas for pilot studies. As a start, two pilot areas, each at least three to four townships in size, could be selected to represent major kinds of forest conditions in Manitoba. One of these areas should probably be selected where there is a good supply of site related information. The other area could be selected where such information is sketchy or unavailable.

2. Photointerpretation and detailed mapping of the pilot areas, using Manitoba Forestry Branch aerial photography (1:15,840) with covertype boundaries, and also using an initial map legend based on existing information as demonstrated by this study.

3. Detailed field sampling within and possibly also outside pilot areas in order to collect data needed to identify and adequately characterize site units and their variability. Information collected at sample plots would include detailed descriptions of soil, site and vegetation properties, and forest productivity data for site index and mean annual increment comparisons. Soil samples would also be collected for laboratory characterization of soils representative of site units. Ecological field plot forms available from other provinces could be used or modified for Manitoba conditions as required.

4. Computer file input of collected data. Use of dataloggers or microcomputers is recommended for most efficient and cost effective data entry.

5. Computer-aided analysis of collected data, including results of soil laboratory analysis, to characterize site classification units.

6. Revision of site mapping legend as required.

7. Digitize final site maps for input on ARC/INFO.

8. Development of interpretative keys using results from the computer aided analysis. Input from experienced operational forestry personnel should also be used to develop these interpretative keys.

9. Preparation of initial field guide to be used in conjunction with site maps and interpretative keys for technology transfer testing before adopting an operational program. Field guide should be modelled on those prepared for Ontario (Jones et al., 1986) and Alberta (Corns and Annas, 1986) for convenient use in the field.

10. Field examination of site units in the company of experienced operational foresters at various intervals in order to evaluate the development and use of site classes, site maps and interpretative keys for operational purposes. This combined input and technical transfer process is regarded as critical to developing a forest site classification that can be used by operational personnel."

(Wells, 1987; p. 83, 84, 85)

These recommendations apply mostly to process and provide only general considerations for classification rather than a structure.

Review of the Phase I report and other available information and discussions with CFS and MFB personnel resulted in identification of the following guiding principles:

1. The system should be useful for operational planning of sites (0.5 to 2 ha minimum size), but also for regional planning of large areas.

2. The system should be applicable at reasonable cost to very large areas of land with limited ground access, and very little available information.

3. The system should provide information requirements for silvicultural and harvesting planning requirements.

4. The system should be relatively simple and easy to use, and should favor a pragmatic rather than a puristic approach.

2.3 THE PROPOSED CLASSIFICATION AND MAPPING SYSTEM

Review of the project guidelines and available systems (in particular Corns and Annas, 1986) led to adoption of a system that involves two conceptual levels:

1. Land System mapping
2. Forest Ecosystem (site) classification

2.3.1 LAND SYSTEM MAPPING OF DUCK MOUNTAIN PILOT AREA

The Land System mapping approach generally follows the concepts of the Canadian Ecological Land Classification (ELC) system (Wiken et al., 1980). The ELC system provides a hierarchical framework to classify and map landscapes at various levels of detail. The levels in the ELC system are:

- Ecoprovince (also called Ecozone)
- Ecoregion
- Ecodistrict (also called Land District)
- Ecosection (also called Land System)
- Ecosite
- Ecoelement

An ecological map base for the Prairie Provinces was published by Adams (1985) that identifies Ecoregions and Habitat Subregions at 1:1,000,000 scale. The source of information used for Manitoba was from Manitoba Soil Survey (Mills 1980, 1983). Since this database is published and is suitable for an upper-level classification of forest land it was adapted for this pilot study.

The hierarchy of land classification used at Duck Mountain departs somewhat from the classical terminology of the ELC system to be as follows:

- Ecozones (part of Boreal Plains)
- Ecoregion } Defined by Adams (1985) and mapped
- Habitat Subregion } at 1:1,000,000
- Land System - mapped at 1:50,000
- Forest Ecosystem - used to classify a site

ECOREGIONS (from Adams 1985)

An Ecoregion is a general land mapping level characterized by broad divisions of land integrating macro-biota and soil indicators of latitudinal gradients of climatic change (Rowe 1979). According to the Environmental Conservation Task Force (1981), ecoregions are assemblages of regional landforms characterized by distinctive ecological responses to climate as expressed by development of vegetation, soils, water and fauna. Ecoregions are recognized by assemblages of soil great groups, plant regions, meso climate, large water basins and faunal communities.

HABITAT SUBREGIONS (from Adams 1985)

A Habitat Subregion is a landscape division of the ecoregion delineated at the third hierarchical level. It is defined by elevation, relief, regional surface form, drainage and by broad genetic materials (Pedocan 1983). Each subregion is conceptually similar to ecodistricts, but is characterized less by homogeneity of surface materials, and more by similarities in landform, vegetation components, and wetland distribution patterns. Examples of habitat subregions are glacial-fluvial-lacustrine plains, hummocky moraines, and bedrock controlled plateaus.

LAND SYSTEMS

A Land System is a unit or pattern of land, mappable at 1:50,000, that is distinguished (on 1:50,000 airphotos) from adjacent land on the basis of surface form, materials, and hydrology. Forest cover is often a clue to materials and hydrology but is not diagnostic of Land Systems. A Land System may be relatively homogeneous (eg. a large bog, or a lacustrine plain) or it may be highly heterogeneous (eg. a hummocky moraine with dry and wet sites, including small bogs). The Land System can however be described and defined, and the most common Forest Ecosystems can be listed.

The development of the map scale, diagnostic criteria, and legend design and presentation is intended to be practical for forest land managers. Some purists may argue that classification concepts and terms are being violated, but this is not intended to be an academic exercise - hopefully we will be excused. The Land System maps are intended for "non-site-specific" uses such as:

1. Regional planning and policy development.
2. General location of transportation routes.
3. Interface with hydrology, wildlife habitat and other resource interest planners, and
4. Narrowing the list of potential ecosystems for site classification.

The Land System maps are not intended to be used for:

1. Making site prescriptions, and
2. Detailed location of roads or other facilities.

Limitations of map scale and heterogeneity of many Land Systems dictate that decisions of a site-specific nature require site inspection and Forest Ecosystem classification. This approach avoids many of the criticisms and concerns about map reliability, and reduces groundtruthing costs of mapping.

2.3.2 FOREST ECOSYSTEM CLASSIFICATION

The Forest Ecosystem classification identifies and names a site (an area as small as 0.1 ha) by its plant association and soil series. The plant association and soil series are keyed to Ecoregion and Habitat Subregion (climate), and provide direct correlation to moisture and nutrient regimes, landform and surficial geological materials, vegetation successional stage and dynamics, and soil classification and chemical and physical properties. These are the variables that relate to site productivity and response of the ecosystem to silvicultural and harvesting treatments.

The forest ecosystem concept is derived from the classical work of Krajina (1965) and his students in British Columbia; from Mueller-Dombois in SE Manitoba (1964); from Daubenmire (1952); and from Braun-Blanquet (1932). More recent application of the concepts by Corns and Annas (1986) in western Alberta; by Kabzems, Kosowan and Harris (1986) in Saskatchewan, by Jones et al. (1983) in the claybelt of Ontario have refined site classification in Canada. This approach allows a forest land manager to identify and name (i.e. classify) a site by its vegetation (trees and lower plants) and soil - and relate it to defined management methods with expected results. He can also communicate experience with this ecosystem to other land managers and researchers.

A Forest Ecosystem is defined as a "land" area with a particular soil series and plant association (or potential to support that plant association). This concept embraces all ecosystem parameters from the tree layer to approximately 2 m below the ground surface and laterally covering an area of about 0.1 to 2 or more hectares. The trees, shrubs, ground vegetation, landform, soils, and hydrology are considered.

A Plant Association is a recognizable group of associated plant species. Nine common plant associations were recognized in the Boreal Mixedwood part of the Duck Mountain pilot area. Some of these can be subdivided into phases based on dominant tree species.

A Soil Series is a recognizable soil type on a particular geological material. A soil series is named after a local geographic feature for ease of reference. For example, the Waitville soil series is a moderately well drained, Orthic Gray Luvisol developed in strongly calcareous, loamy till that occurs in Ecoregion 8. Once learned, the soil series in an area are quite easy to recognize.

Vegetation was used as the initial discriminator in the classification. The Cornell Ecology Program TWINSPAN (Hill 1979a), or two-way indicator species analysis, was used to classify the vegetation into plant associations. TWINSPAN accomplishes this by classifying both plots and species using an ordination algorithem. A two-way table is produced which groups floristically similar plots and ecologically similar species. An advantage of TWINSPAN is it identifies key indicator species for each division point in the classification hierarchy. This was useful when constructing the key to the forest ecosystems (see Appendix I).

The plant association was the basic unit in the vegetation classification. An association is an abstract vegetation unit characterized by the common occurrence of a group of associated plant species. In some cases facies were recognized, which are sub-divisions of the plant associations. Facies are characterized by the dominance of a certain (or several) species. For example, in the Boreal Mixedwood Ecoregion the White Spruce/Viburnum/Aralia association has five facies depending on which of white spruce, trembling aspen, balsam poplar, white birch or black spruce is the dominant tree.

The vegetation classification was then examined and refined using a separate classification based on selected site and soil variables. These variables (aspect, slope, macro and meso site position, moisture regime, nutrient regime, and silt and clay content of the A horizon) were subjected to Ward's (1963) method of cluster analysis using the program CLUSTAN (Wishart 1978). Ward's method groups plots together based on a quantitatively derived similarity index using the selected variables. The results, plotted as a dendrogram, were used subjectively to modify and refine any anomalies in the vegetation classification. In future studies we suggest that an ordination procedure, such as Cornell Ecology Program DECORANA (Hill 1979b), might also be an appropriate method of relating the vegetation classification to site and soil variables.

The forest ecosystems were named using the plant association (or facies) name and the dominant or modal soil series found with that association. The plant association names were based on usually the dominant plant species of each well developed layer.

3. METHODS

3.1 FIELD SAMPLING

The objectives of field sampling were to:

1. Provide a vegetation and soil data base for the ecosystem classification, and
2. Groundtruth the Land System mapping.

Sample plots were located on representative, modal forest sites. Due to time constraints most plots were located within 1.6 km of vehicle access.

Sample plots were located in relatively homogeneous sites. Sites with obviously discontinuous vegetation, soils or topography, such as ecotones, or edge-effect areas, were avoided. Sampling was confined to forested sites. Thus, farmlands and non-treed wetlands were not sampled and farmlands were not mapped. Logged areas also were not sampled, but they were included in the mapping. Both seral and climax vegetation were sampled.

Field sampling followed the methods and data forms given in Walmsley et al. (1980). More detailed descriptions of methods and sampled variables are available in Walmsley et al. (1980).

Vegetation sample plots were 20 x 20 m. Within each plot, canopy cover (Daubenmire 1959) was estimated to the nearest percent for every plant species in each layer, and for each layer in total. Plants with less than 1% cover were considered to have 0.5% cover. The layers recognized were:

1. Tree Layer (>10 m);
2. Tall Shrub Layer (2-10 m);
3. Low Shrub Layer (<2 m);
4. Herb Layer (includes dwarf-shrubs); and
5. Moss Layer (includes terrestrial mosses, liverworts and lichens).

The tree layer was further divided into veteran, dominant, main, and low layers depending on the relative age, height, and canopy cover of the trees (see Walmsley et al., 1980).

Voucher specimens were collected for most plant species and will be deposited in the CFS Herbarium, Edmonton. Epiphytes and fungi were neither listed nor sampled. Species nomenclature follows Scoggan (1957).

A number of site and landscape features were assessed in each plot, including:

1. Aspect;
2. Slope;
3. Landform and Surface Expression;
4. Macro and Meso Site Position;
5. Ecological Moisture Regime;
6. Nutrient Regime;
7. Soil Drainage;
8. Depth to Water Table, Effective Rooting, and Carbonate;
9. Vegetation Successional Status;
10. Humus Form; and
11. Percent Cover of the Different Substrate Types in the plots.

Furthermore, a site position, cross-sectional diagram was drawn for each plot.

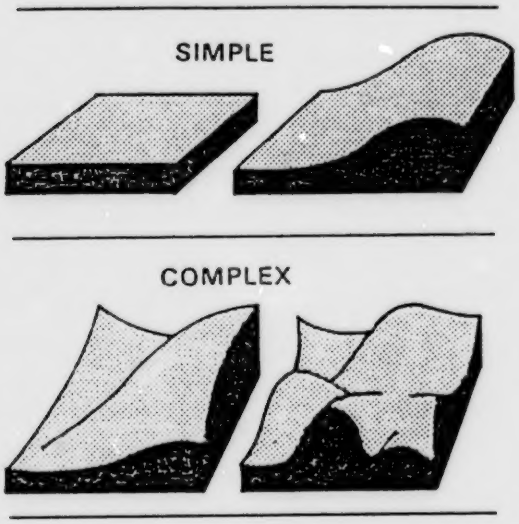
A soil pit was dug in the center of each plot. Profile descriptions were made, including information on:

1. Horizon designation, depth, and thickness;
2. Coarse Fragments;
3. Texture;
4. Structure;
5. Consistence;
6. Color;
7. Mottles; and
8. Organic Materials.

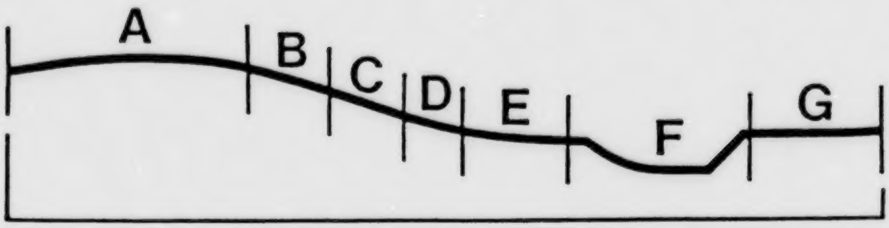
Guidelines for describing site and soil properties are found in Walmsley et al. (1980), and some of the main concepts are described in the following figures and tables.

At 16 plots selected for their representativeness, bulked soil samples were collected from each horizon for lab analysis (see Section 3.2). In 27 other plots soil samples were collected for additional pH determinations.

SLOPE



SITE POSITION ON SLOPE



A CREST - the generally convex upper most portion of a hill (meso scale) - it is usually convex in all directions no distinct aspect

B UPPER SLOPE - - the generally convex upper portion of the slope of a hill (meso scale) immediately below the crest - it has a convex surface profile with a specific aspect

C MIDDLE SLOPE - the area of the slope of a hill between the upper slope and the lower slope, where the slope profile is not generally concave or convex - it has a straight or somewhat sigmoid surface profile with a specific aspect

D LOWER SLOPE - the area toward the base of the slope of the hill. It generally has a concave surface profile with a specific aspect

E TOE - the lower part of the slope. Area defined by extent of homogeneous site of slight slope and/or sometimes clearly demarcated by an abrupt levelling of the slope. Often characterized by seepage

F DEPRESSION - at the foot of a meso scale mound or in generally level area any area that is concave in all directions

G LEVEL any level meso scale area not immediately adjacent to a meso scale mound. Surface profile generally horizontal. No aspect

Courtesy: Ontario Institute of Pedology

Figure 1. Guide to slope type and site position.

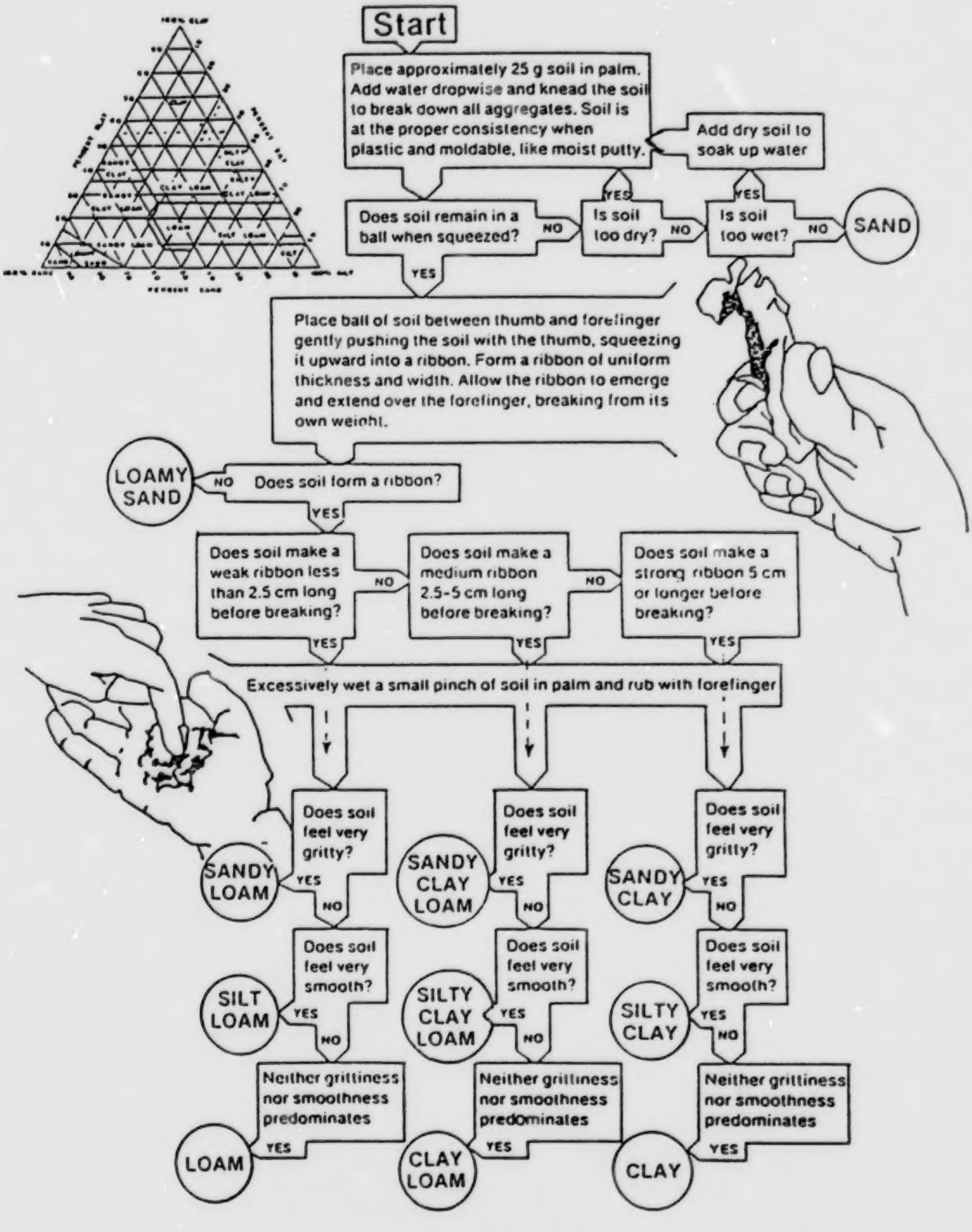
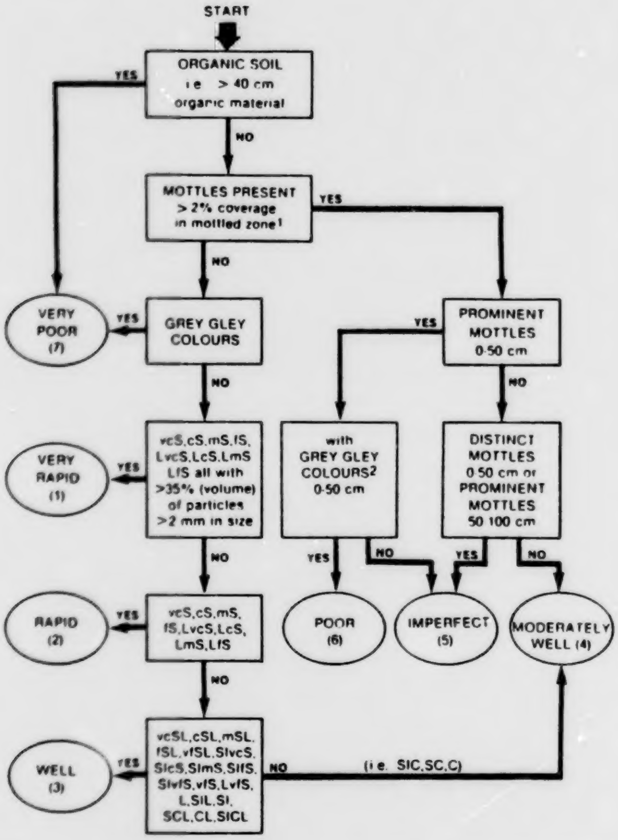

Start
Place approximately 25 g soil in palm. Add water dropwise and knead the soil to break down all aggregates. Soil is at the proper consistency when plastic and moldable, like moist putty.
Add dry soil to soak up water
Does soil remain in a ball when squeezed?
NO
Is soil too dry?
YES
NO
Is soil too wet?
YES
NO
SAND
YES
Place ball of soil between thumb and forefinger gently pushing the soil with the thumb, squeezing it upward into a ribbon. Form a ribbon of uniform thickness and width. Allow the ribbon to emerge and extend over the forefinger, breaking from its own weight.
LOAMY SAND
NO
Does soil form a ribbon?
YES
Does soil make a weak ribbon less than 2.5 cm long before breaking?
NO
Does soil make a medium ribbon 2.5-5 cm long before breaking?
NO
Does soil make a strong ribbon 5 cm or longer before breaking?
YES
YES
YES
Excessively wet a small pinch of soil in palm and rub with forefinger
Does soil feel very gritty?
SANDY LOAM
YES
NO
Does soil feel very gritty?
SANDY CLAY LOAM
YES
NO
Does soil feel very gritty?
SANDY CLAY
YES
NO
Does soil feel very smooth?
SILT LOAM
YES
NO
Does soil feel very smooth?
SILTY CLAY LOAM
YES
NO
Does soil feel very smooth?
SILTY CLAY
YES
NO
Neither grittiness nor smoothness predominates
YES
LOAM
Neither grittiness nor smoothness predominates
YES
CLAY LOAM
Neither grittiness nor smoothness predominates
YES
CLAY

Figure 2. Instructional diagram for determining soil texture by feel (Thien, S.J., 1979. J. of Agronomic Education, Vol. 8)



---

1 Exclude mottles that are few or faint
2 Gley Colours
Chroma 1 any hue
Chroma 2 hues 10 YR or redder
Chroma 3 hues yellower than 10YR
any chroma, hues bluer than 10Y
any chroma, reddish hues

S = SAND or SANDY
SI = SILT or SILTY
L = LOAM or LOAMY
C = CLAY

vc = very coarse
c = coarse
m = medium
f = fine
vf = very fine

examples
vcS = very coarse SAND
LvfS = LOAMY very fine SAND
SICL = SILTY CLAY LOAM

Figure 3. Soil drainage (Jones et al., 1983).

Table 1. Ecological moisture regime classes (after Walmsley et al. (1980).

Moisture regime	Description	Primary water source	Slope position
0 Very xeric	Water removed extremely rapidly in relation to supply; soil is moist for a negligible time after precipitation	Precipitation	Ridge crests shedding
1 Xeric	Water removed very rapidly in relation to supply; soil is moist for brief periods following precipitation	Precipitation	
2 Subxeric	Water removed rapidly in relation to supply; soil is moist for short periods following precipitation	Precipitation	Upper slopes shedding
3 Submesic	Water removed readily in relation to supply; water available for moderately short periods following precipitation	Precipitation	
4 Mesic	Water removed somewhat slowly in relation to supply; soil may remain moist for a significant, but sometimes short period of the year; available soil moisture reflects climatic inputs	Precipitation in moderately to fine-textured soils & limited seepage in coarse-textured soils	Mid-slope normal rolling to flat
5 Subhygric	Water removed slowly enough to keep the soil wet for a significant part of the growing season; some temporary seepage and possibly mottling below 20 cm	Precipitation and seepage	Lower slopes receiving
6 Hygric	Water removed slowly enough to keep the soil wet for most of the growing season; permanent seepage and mottling present; possibly weak gleying	Seepage	
7 Subhydric	Water removed slowly enough to keep the water table at or near the surface for most of the year; gleyed mineral or organic soils; permanent seepage less than 30 cm below the surface	Seepage or permanent water table	Depressions receiving
8 Hydric	Water removed so slowly that the water table is at or above the soil surface all year; gleyed mineral or organic soils	Permanent water table	

[1] Texture symbols are as follows: L = loam(y), S = sand(y), and Si = silt(y).

Table 2. Nutrient regime characteristics[1] (after Walmsley et al., 1980).

	A. Oligotrophic	B. Submesotrophic	C. Mesotrophic	D. Permesotrophic	E. Eutrophic	F. Hypereutrophic
Definition	Very poor nutritional status, very small supply of available nutrients	Poor nutritional status, low supply of available nutrients	Medium nutritional status, medium supply of available nutrients	Rich nutritional status, plentiful supply of available nutrients	Very rich nutritional status, abundant supply of nutrients	Saline nutritional status, excess salt accumulations
Bedrock source	Granite Rhyolite Quartzite Quartz sandstone	Granodiorite Dacite Quartz gneiss Conglomerate	Diorite Andesite Garnet schist Graywacke	Gabbro Biotite schist Argillite Shale	Peridotite Dunite Basalt Slate Phyllite Dolomite Limestone	Serpentine Marble Gypsum Halite
Texture	Very coarse	Coarse	Medium	Fine	Very fine	Variable
Organic matter content	Low		Moderate	High		Variable
Humus form	Acid mors	Mors and moders		Moders and mulls		
Soil reaction	Extremely acid to medium acid		Medium acid to neutral	Slightly acid to mildly alkaline		Moderately to strongly alkaline
Cation exchange capacity	Low		Moderate	High		Variable
Base saturation	Low		Moderate	High		Variable
Carbon/nitrogen ratio	High		Moderate	Low		Variable

---

[1] The presence of nutrient-rich seepage waters may compensate for other factors to create eutrophic conditions.

Table 3. Soil mineral horizon and modifier descriptions.[1]

Ah, Ap	Dark-colored, mineral, surface horizons, enriched with organic matter (**p** is man modified, e.g., plow layer)
Ae	Light-colored, near surface horizon; horizon of loss of iron, aluminum, organic matter, or clay
AB	Transition horizon from A to B
Bt	Brownish subsurface horizon, enriched with clay that has been moved from the Ae horizon
Bm	Brownish subsurface horizon with only slight addition of iron, aluminum, or clay
Bf, Bhf	Reddish-brown subsurface horizon; significant accumulation of iron, aluminum, and/or organic matter
Bg	Horizons with grey gley colors, mottling, or both
BC	Transition horizon from B to C
C	Relatively unweathered material from which the soil profile has developed
Ck	C horizon containing calcium and/or magnesium carbonates that will effervesce with dilute HCl
j	Used with suffixes **e**, **f**, **g**, and **t** to denote an expression of but failure to meet the specified limits of the suffix it modifies (e.g., Bfj, Ckgj)
Solum	A and B horizons in which the parent material (C) has been modified

ROMAN NUMERALS:

Roman numeral two (II) preceding the horizon designation indicates a significant change in texture (mode of decomposition) within the profile, e.g., silty loam over coarse sand.

---

[1] For more information on soils description and classification, see Canada Soil Survey Committee (1978) and Walmsley et al (1980)

Table 4. Forest humus horizons and humus types.

L, F, H	Organic horizons developed primarily from the accumulation of leaves, twigs, and woody material with or without a minor component of mosses; usually not saturated for prolonged periods; >17% organic C (approximately 30% organic matter by weight)
L	Characterized by an accumulation of mainly leaves (and needles), twigs, and woody materials; some of the original structures are easily discernible
F	Characterized by an accumulation of partly decomposed organic matter derived mainly from leaves, twigs, and woody materials; some of the original structures difficult to recognize; material may be partly comminuted by soil fauna, as in a moder, or it may be a partly decomposed mat permeated by fungal hyphae, as in mor
H	Characterized by an accumulation of decomposed organic matter in which the original structures are indiscernible; differs from the F by having greater humification chiefly due to the action of organisms; it may be sharply delineated from the mineral soil, as in a mor where humification is chiefly dependent upon fungal activity, or it may be partially incorporated into the mineral soil, as in a moder
Ah	Mineral horizon enriched with organic matter (>17% organic C by weight)
Of, Om, Oh	Organic horizons developed mainly from mosses, rushes, and woody material; >17% organic C (approximately 30% organic matter by weight)
Of (fibric)	The least decomposed organic horizon, containing large amounts of organic fiber (von Post 1-4)
Om (mesic)	An intermediately decomposed soil horizon with properties intermediate of an Of and Oh (von Post 5 and 6)
Oh (humic)	The most decomposed organic horizon, containing only small amounts of well preserved fiber and the major amount of material at an advanced state of decomposition (von Post 7-10)

3.2 SOIL LABORATORY ANALYSES

Soil analyses were conducted at Norwest Labs, Edmonton, using procedures (Table 5) adopted by the Canada Soil Survey Committee (McKeague, 1978). The sample depths and types of analysis were chosen to identify the soil parameters usually related to moisture and nutrient supply to trees and other plants.

Table 5. Methods of soil analysis.

Soil Property	Method*
pH	$CaCl_2$
Calcium Carbonate Equivalent	gravimetric loss, 3M HCl
Extractable Cations (Ca, Mg, Na)	ammonium acetate, pH7, atomic absorption
Organic Carbon	Leco furnace, infra-red, carbonates removed
Total N	semi-micro Kjeldahl, $N0_3 + N0_2$ not included
Bulk Density	core 10 cm diameter x 6.5 cm length
Particle Size Analysis	Two point hydrometer

3.3 SITE PRODUCTIVITY ANALYSIS

Forest inventory data for 100 plots was used to estimate two distinct measures of productivity: site index (SI) and mean annual increment (MAI). These variables were then related to a number of site factors including aspect, slope position, moisture and nutrient regimes. A complete list of variables is given in Table 6.

Table 6. Variables Used in the Study.

a) Continuous Variables

SWDSI - Softwood site index
HWDSI - Hardwood site index
MAI - Mean annual increment
Slope - Percent slope
Silt-clay - Silt and clay content (%)

b) Discrete Variables

Aspect - 8 classes with north facing being class 1 and south facing being class 8
Macro - Macro slope position (7 classes)
Meso - Meso slope position (7 classes)
Moisture - Ecological moisture regime (9 classes)
Nutrient - Ecological nutrient regime (6 classes)
Plant - Plant association (31 classes)
Soiln - Soil series (25 classes)
Econum - Ecoregion - lowlands or boreal mixedwood
Organic - Organic soil indicator - is organic if silt-clay content is zero

3.3.1 DETERMINATION OF MAI

At each variable radius plot, the cruiser recorded trees by species, diameter at breast height (dbh), and height. This data was converted to a gross merchantable volume per hectare estimated by using the following Manitoba volume equation:

$$V = a + \frac{b\,D^2\,H}{100}$$

where: V = gross merchantable volume of tree (m^3)
D = dbh (cm)
H = total tree height (m)
a, b = coefficients which vary with species and dbh

These tree volumes were then expanded to a per hectare basis and all volumes summed to give total volume per hectare.

Plot age was based on the age of one sample tree per plot. Age was measured at breast-height (1.3 m) and stump height (0.3 m). For deciduous species, total age was assumed to be the same as stump age but for coniferous species, five years was added to stump age to obtain total age.

Finally, total volume was divided by age to give MAI (in m^3/ha/yr). No attempt was made to calculate MAI by species or combinations of species since such partitioning can cause misleading results when MAI is being used as a measure of site productivity. For example, a mixedwood plot might well have a large total volume and MAI even though white spruce volume and MAI could be small. Use of the white spruce MAI would lead to the incorrect inference that productivity of the site is low.

3.3.2 DETERMINATION OF SI

At each plot, the felled tree was sectioned until the following relationship was approximately satisfied:

$$\text{Age} - \text{count} = 50$$

where: age = breast height age
count = ring count at section
50 = reference age used in SI calculations

Then tree height (m) to that point as well as breast height age and ring count at that point were recorded. Since the relationship was seldom exactly satisfied, the Alberta Forest Service height-age model (Alberta Forest Service 1985) was used to correct SI to the reference age of 50 years.

Because the height-age relationships between softwood and hardwood species are frequently quite different, the SI data was divided into two groups depending on whether the sampled trees were softwoods or hardwoods. Further subdivisions by individual species were not used in this study for two reasons. First, partitioning the data by species resulted in a small number of plots in most groups. The second reason arises because plot selection was based primarily on site classification, not species. As a result there is not a good representation of all species across all sites.

3.3.3 ANALYSES OF CONTINUOUS INDEPENDENT VARIABLES

Simple correlation analysis was used to evaluate the relationships between the two productivity measures and the two independent variables that are continuous: slope and silt-clay content. Scatter plots were checked for the presence of nonlinearity in the relationships. It should be pointed out that the percent cover data by species was not utilized because plot representation was inadequate for partitioning the population by species. Note that there were 228 species but only 100 plots. Therefore there is a very high probability of observing significant differences which have in fact occurred by chance alone.

3.3.4 ANALYSIS OF DISCRETE VARIABLES

Analysis of variance (ANOVA) was used when the independent variables were discrete. For variables that were significant, range tests based on the Student-Newman-Keuls test (Steel and Torrie 1980) were performed.

Finally, two-way ANOVA and analysis of covariance were used in a few cases to check for interactions among certain variables.

4.0 LAND SYSTEMS

The concepts and background for this pilot Land system mapping program were explained in Sections 1 and 2 of this report. The system is hierarchical - that is the landscape is mapped at different scales and degrees of generalization. The higher levels - the Ecozones, Ecoregions and Subregions were taken from Adams (1985). The Ecozones and Ecoregions are shown in Figure 4, reproduced from Adams. The Ecoregions and Subregions of the Duck Mountain area are illustrated in Figure 5 (also from Adams).

The pilot project area extends from the Boreal Mixedwood Ecoregion on top of the Duck Mountains down to the Mid-Boreal Lowlands at Cowan. There is one Subregion (8.104 Duck Mountains) in the Boreal Mixedwood, and two Subregions (20.13 Swan River Plain and 20.14 Duck Mountain Escarpment) in the Mid-Boreal Lowlands. The Ecoregions and Habitat (Forest) Subregions of Duck Mountain and surrounding areas are reproduced in Figure 5.

4.1 DUCK MOUNTAIN SUBREGION

The Duck Mountain Subregion (8.104) is an upland with elevations of 2200 to greater than 2600 feet (670 to 790 m) above sea level, which is the highest area in Manitoba. The land surface is mostly a hummocky moraine with very steep slopes in the highest area around Windy Hill. The morainal surficial materials (mostly a stony, calcareous till) are covered by veneers and blankets of glaciolacustrine clays and silty clays on all but the highest parts of the landscape. Swales and depressions are poorly drained and are often occupied by shallow bogs. Stream channels have low gradients and are usually choked with channel bogs and marshes. The forest is typical Boreal Mixedwood, with white spruce, black spruce or balsam fir being the dominant tree species in mature stands.

Part of the Duck Mountain Subregion Land Systems map and legend is reproduced in Figure 6 to illustrate the level of mapping detail and appearance of map labels and legend design. Land Systems have a short alpha-numeric label that indicates the landform(s) that dominate the landscape. For example, Land System M1 is one of the morainal landscapes in Habitat Subregion 104 (Duck Mountain) of Ecoregion 8 (Boreal

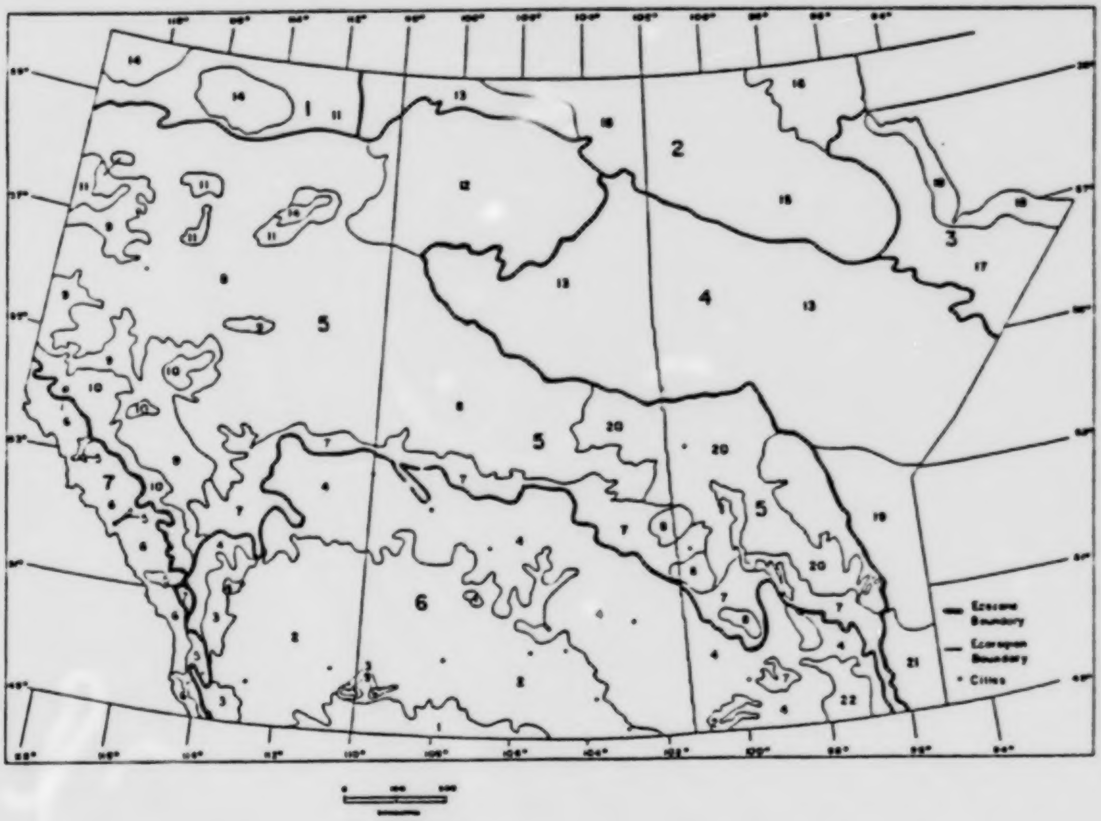


Figure 4. Ecozones and Ecoregions - Prairie Provinces.

Ecozones

1 - Taiga Plains
2 - Taiga Shield
3 - Hudson Plains
4 - Boreal Shield
5 - Boreal Plains
6 - Prairie
7 - Montane Cordillera

Ecoregions

1 - Short-grass Prairie
2 - Mixed-grass Prairie
3 - Fescue Prairie
4 - Parkland
5 - Montane
6 - Mountain Complex
7 - Mid-Boreal Transition
8 - Mid-Boreal Mixedwoods
9 - Mid-Boreal Foothills
10 - Boreal Uplands
11 - High Boreal Plains
12 - High Boreal Sandplain
13 - High Boreal Precambrian
14 - Low Subarctic Uplands
15 - Low Subarctic Precambrian
16 - High Subarctic
17 - Hudson Bay Lowlands
18 - Coastal Lowland
19 - Mid-Boreal Precambrian
20 - Mid-Boreal Lowlands
21 - Low Boreal
22 - Tall-grass Prairie

Source: Harris et al. 1983, Millar 1976, Mills 1979, Pedocan 1983, Wiken 1985 and Zoltai 1975.

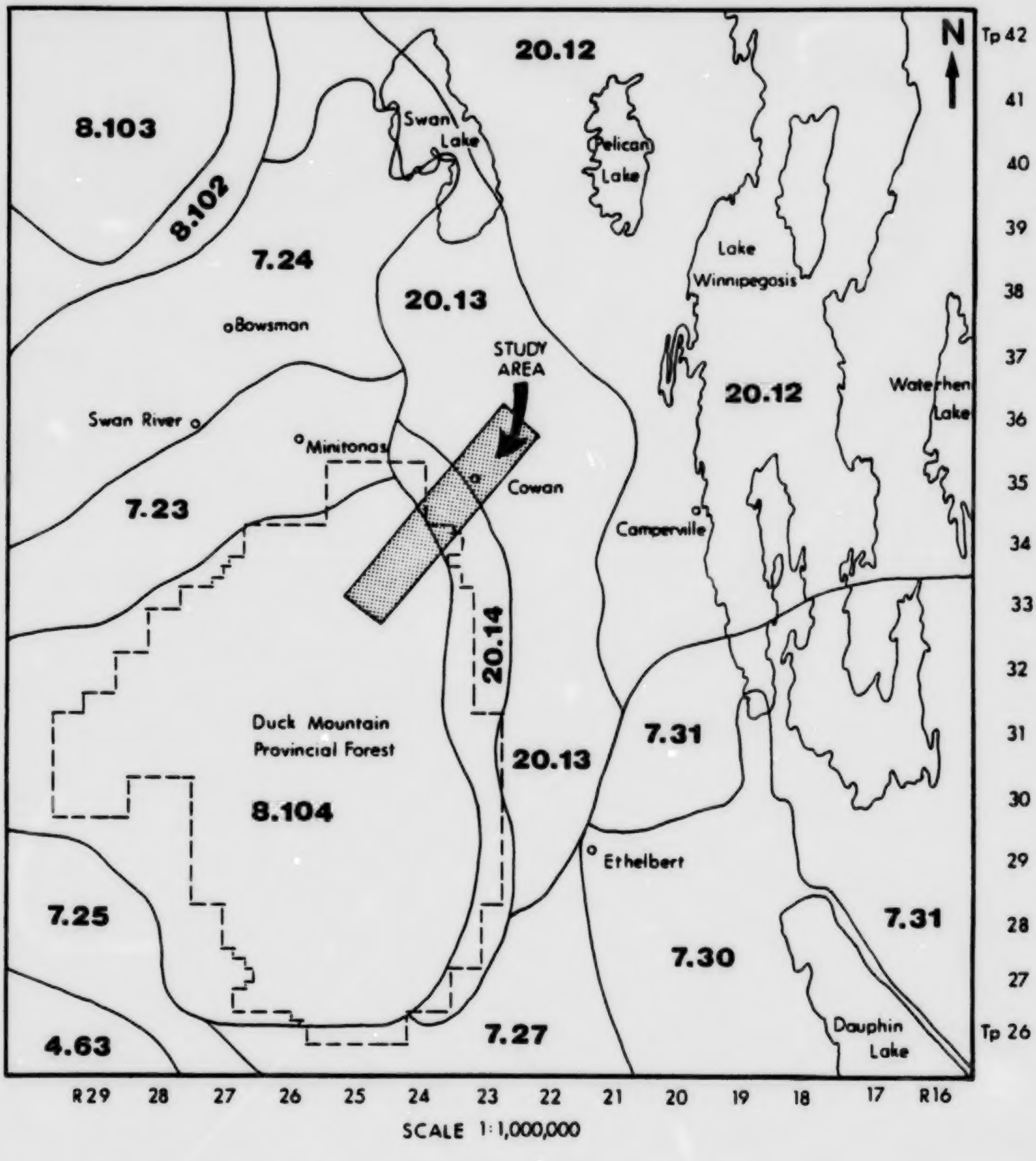


Figure 5. Ecoregions and Habitat (Forest) Subregions of Duck Mountain and surrounding area.

ECOREGION: 8. BOREAL MIXEDWOOD

SUBREGION: 8.104 Duck Mountain

LAND SYSTEMS	SURFACE FORM	MATERIALS	HYDROLOGY	DOMINANT FOREST ECOSYSTEMS
M - Morainal				
8.104 M1	ridged, hummocky, mostly convex, steeply sloping, high relief	fine loamy till, often very cobbly, discont. clay veneers	runoff, top of watershed	BMW5, BMW8, BMW1
ML - Morainal Lacustrine				
8.104 ML1	hummocky, rolling, mostly convex, steeply to moderately sloping, moderate relief	nearly continuous clay veneer over fine loamy till	mostly runoff, upper watershed	BMW5 BMW2, BMW4, BMW8
8.104 ML2	hummocky, rolling, convex and concave, moderately sloping, moderate relief	nearly continuous clay veneer over fine loamy till	runoff and runon, some ponding	BMW3, BMW5, BMW4, BMW9, BMW8
8.104 ML3	rolling and undulating, convex and concave, gentle slopes, low relief	nearly continuous clay veneer over fine loamy till	runoff and runon common ponding, high watertable	BMW3, BMW5, BMW4, BMW9, BMW8
LM - Lacustrine-Morainal				
8.104 LM1	rolling to level, convex to planar, gentle slopes, low relief	clay blankets over till, some fluvial sediments	runoff and runon	BMW5, BMW4, BMW8, BMW2
8.104 LM2	rolling to level, convex, to planar, gentle slopes, low relief	clay blankets over till, some fluvial sediments	mostly runon common ponding, high watertable	BMW4, BMW5, BMW8
8.104 LM3	undulating plain, gently inclined, concave and convex, low relief	clay blankets over till, some fluvial sediments	mostly runon common ponding, high watertable	BMW5, BMW2, BMW8, BMW4
B - Bogs (Organic)				
8.104 B1	blanket and bowl bogs, mounded to depressional	mesic and fibric forest peat over clays or till	rainfed, runon high watertable	BMW9, BMW8
8.104 B2	bowl bogs, mounded, some fen bogs	deep mesic and fibric forest peat	rainfed, runon high watertable	BMW9, also non treed wetlands
S - Stream Channels				
8.104 SB	linear, incised stream channels with blanket bogs associated	variable fluvial sediments, thin to thick peat	runon, ponding, seepage, stream channels	BMW8, BMW9, several riparian types

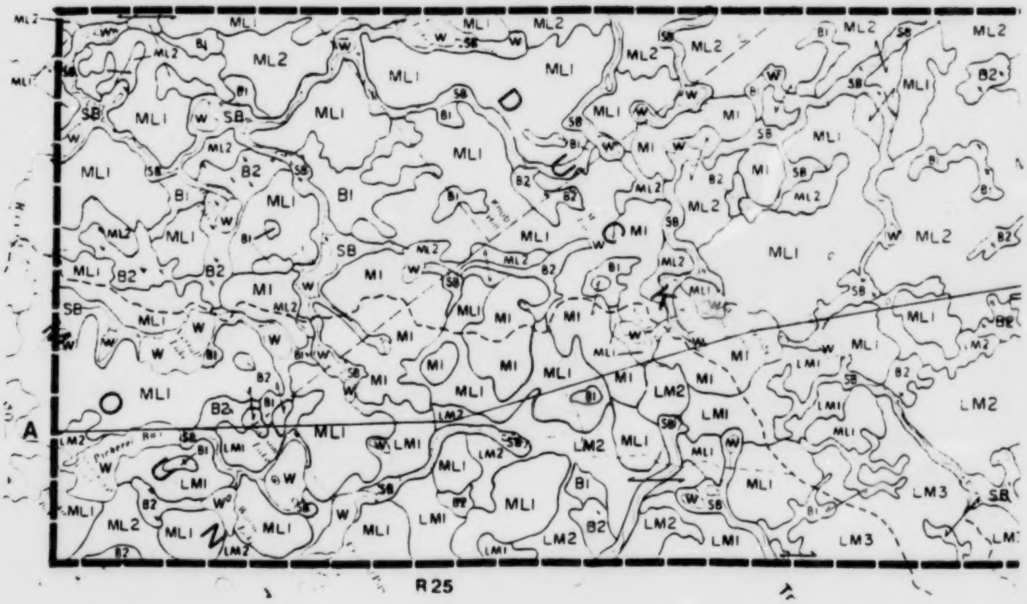


Figure 6. A Portion of the Duck Mountain Subregion Land Systems Map and Legend.

Mixedwood). All areas labelled M1 within a Subregion have similar surface form, materials, and hydrology; and therefore, have the same dominant Forest Ecosystems. The use of the alpha-numeric code allows identification of more than one Land System with the same landform (for example, there are three ML Land Systems) to recognize varying surface forms, materials and hydrology regimes. The higher number usually indicates a greater percentage of wetland (ML3 has more wet areas than ML1).

Diagnostic features for mapping the Land systems are those used to describe the Land Systems in the map legend;

- surface form and relief
- surficial geological materials
- hydrology (position in the watershed and wetness)
- dominant forest ecosystems

Many of these features can be interpreted from air photos, but some groundtruthing is required. In the Duck Mountains there is a great deal of local relief, which is readily interpreted from air photos, and which relates well to landform, materials, hydrology and forest ecosystems. In other subregions relief is much less and can be difficult to see on photos. Diagnostic criteria for mapping will have different relative value in different landscapes.

4.2 SWAN RIVER PLAIN SUBREGION

The Swan River Plain Subregion (20.13) of the Mid-Boreal Lowlands is a very gently sloping plain with low-relief beach ridges. The surficial landforms are low-angle fluvial fans and aprons (coalescing fans) that built into Glacial Lake Agassiz, which subsequently formed a series of beach ridges as the lake subsided. Some of the beach sands were blown into dune shapes, which have been intermittently active over the past several thousand years. More recent fans from streams draining the Duck Mountains have deposited fine sediments between the beach ridges, burying some of the coarser sand sediments.

The Land Systems map legend for the Mid-Boreal Lowlands portion of the pilot project, and the map of part of Subregion 20.13 is presented in Figure 7 to illustrate the mapping approach and presentation. The most extensive Land Systems are FB1 and FB2;

ECOREGION: 20. MID-BOREAL LOWLANDS

SUBREGION: 20.13 Swan River Plain

LAND SYSTEMS	SURFACE FORM	MATERIALS	HYDROLOGY	DOMINANT FOREST ECOSYSTEMS
F - Fluvial Fans				
20.13 F1	high angle fans, dissected, incised stream channels	sandy coarse loamy, often gravelly	rapid runoff or infiltration	MBL2, MBL5, MBL6
20.13 F2	low angle fans, weakly incised, weakly convex or level	loamy, fine sandy	runoff and runon, localized flooding	MBL10, MBL5, MBL8
20.13 F3	low angle fans, weakly incised stream channels	loamy, fine sandy	runon, flooding ponding, high watertable	MBL10, MBL8
FB - Glaciofluvial Ridged Outwash and Beaches				
20.13 FR1	beach ridges, convex, low relief	coarse sandy	runoff or rapid infiltration	MBL2, MBL1
20.13 FR2	bars and swales between beach ridges, concave and convex	coarse to fine sandy	runoff and runon local ponding and high watertable	MBL2
20.13 FB1	low ridges and swales with discontinuous blanket bogs (30% of area)	coarse to fine sandy over clay, discont thin forest peat	runon and some runoff, extensive ponding, high watertable	MBL4, MBL1, MBL11, other wetlands
20.13 FB2	low ridges and swales with discontinuous blanket bogs (50% of area)	coarse to fine sandy over clay, discont thin forest peat	runon and some runoff, extensive ponding, high watertable	MBL4, MBL1, MBL11, other wetlands
FD - Fluvial Duned				
20.13 FD1	duned beach ridges mostly convex, low relief	coarse to fine sandy	runoff	MBL1, MBL4
20.13 FD2	duned beach ridges convex and concave low relief	coarse to fine sandy discontinuous peat veneers	runoff and runon high watertable	MBL1, MBL4, MBL3, MBL11
FM - Fluvial Morainal				
20.13 FM4	rolling to undulating, convex, low to moderate relief	loamy to sandy fluvial veneers over fine loamy calcareous till	runoff	MBL2, MBL12, MBL11, MBL7

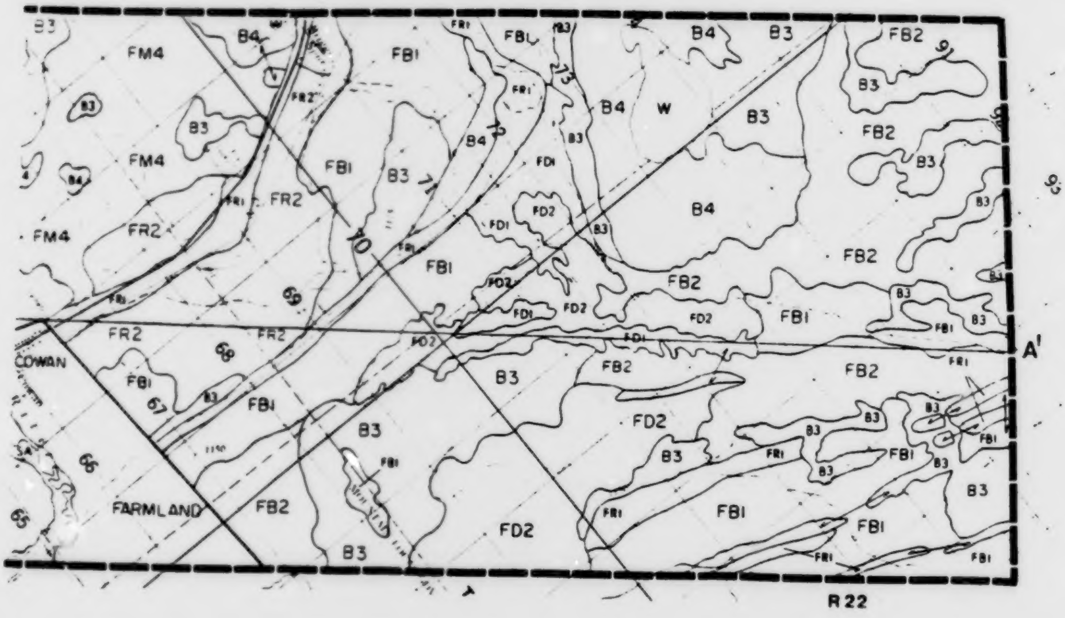


Figure 7. A portion of the Swan River Plain Subregion Land Systems Map and Legend.

which are glaciofluvial outwash fans with low beach ridges, and discontinuous bogs in the swales. There are also FR Land Systems - higher relief beach ridges; and FD Land Systems - beach ridges that have been duned. The B Land Systems are bogs - or more precisely peatlands that include bogs, fens and marshes.

4.3 DUCK MOUNTAIN ESCARPMENT SUBREGION

The Duck Mountain Escarpment Subregion (20.14) is, as the name suggests, a narrow Subregion that delineates the slopes of the Duck Mountain upland (Figure 5). Land surfaces consist of eroded and dissected moraines and fluvial fans, and inclined plains.

This narrow area is a transition between ecoregions, and contains components of both, which makes it a rather inappropriate location to identify typical ecosystem relationships for ecoregions. The surficial geology is also complex and materials change considerably over short distances. Ecosystems identified in this Subregion are common to both 8.104 and 20.13.

5.0 FOREST ECOSYSTEMS OF THE PILOT AREA

Forest Ecosystem concepts and definitions were presented in Section 2 of this report. The ecosystems are subdivided by ecoregion for keying and description. A dichotomous key to the ecosystems is presented in Appendix I. Symbols appearing in the Ecosystem diagrams are presented below:

PARENT MATERIAL:

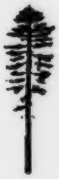
E	Eolian	O	Organic
F	Recent fluvial	T	Till
GF	Glaciofluvial	T	Till (stony)
L	Glaciolacustrine		

TREE SPECIES:

trembling aspen
(Populus tremuloides)

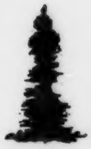
balsam poplar
(Populus balsamifera)

paper birch
(Betula papyrifera)


lodgepole or jack pine
(Pinus contorta or P. banksiana)

white spruce
(Picea glauca)

black spruce - upland
(Picea mariana)


black spruce - bog
(Picea mariana)

balsam fir
(Abies sp.)

5.1 FOREST ECOSYSTEMS OF THE BOREAL MIXEDWOOD

5.1.1 KEY TO THE FOREST ECOSYSTEMS OF THE BOREAL MIXEDWOOD - SUBREGION: 8.104

CODE	FOREST ECOSYSTEM (PLANT ASSOCIATION - SOIL SERIES)
BMW 1	TA/Corylus/Aralia - Waitville
BMW 2	JP/Lycopodium/Pleurozium - Waitville
BMW 3	BS/Pleurozium - Hylocomium - Breckon
BMW 4	WS/Hylocomium - Verrall Lake
BMW 5a	WS/Viburnum/Aralia - Waitville (Duck Mountain)
BMW 5b	TA/Viburnum/Aralia - Waitville (Duck Mountain)
BMW 5c	BPO/Viburnum/Aralia - Waitville (Duck Mountain)
BMW 5d	WB/Viburnum/Aralia - Waitville (Duck Mountain)
BMW 5e	BS/Viburnum/Aralia - Waitville (Duck Mountain)
BMW 6	WS/Equisetum - Rackham
BMW 7	BF - Singush
BMW 8	BS/Ledum/Pleurozium - Okno
BMW 9	BS/Ledum/Sphagnum - Okno

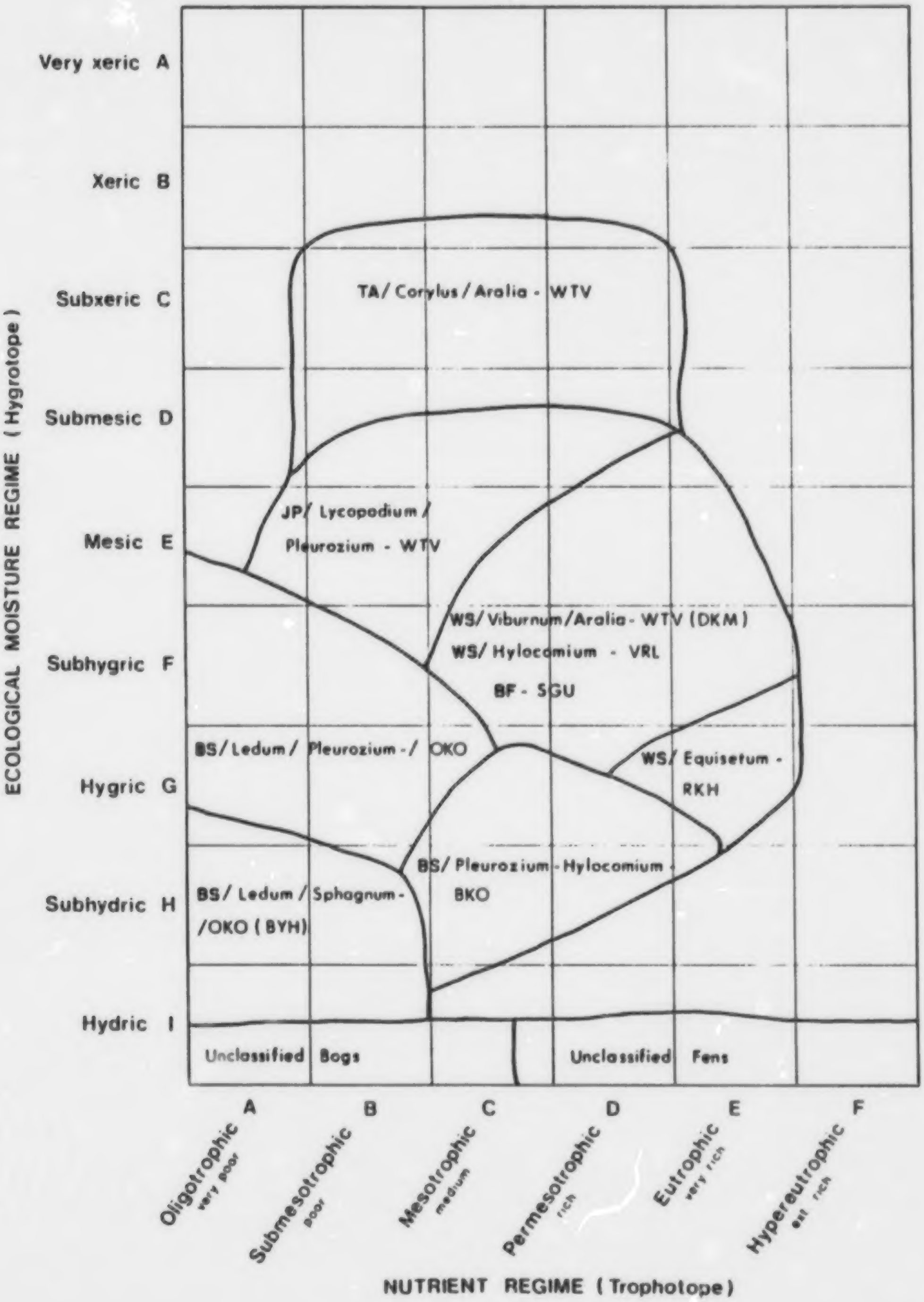
TA - trembling aspen
JP - jackpine
BS - black spruce
WS - white spruce
BPO - balsam poplar
WB - white birch
BF - balsam fir

5.1.2 KEY TO THE SOILS OF THE BOREAL MIXEDWOOD - SUBREGION: 8.104

DRAINAGE GROUP	SOIL SUBGROUP	FLUVIAL	GLACIOFLUVIAL		GLACIOLACUSTRINE			MORAINAL
		loamy alluvium, mod. calcareous	sand and gravel outwash, strongly calcareous	sand to sandy loam outwash, mod. calcareous	loamy, mod. to strongly calcareous	clayey, mod. calcareous	clay veneer overlying loamy till	loamy till, strongly calcareous
Well	O.GL	-	Woodridge (WOG)	Copernicus (COPX)	Rackham (RKH)	Blackstone (BCS)	Duck Mountain (DKM)	Waitville (WTV)
Imperfect	GL.GL	-	-	-	-	Verrall Lake (VRL)	Singush (SGU)	Tee Lake (TEK)
Poor	R.G(C.)	Big Lake (BGA, BGAp)	-	Flood Lake (FOD, FODp)	-	-	-	-
	R.HG	-	-	-	Proven Lake (PVK)	Breckon (BKO, BKOp)	Whitefish (WFS, WFSp)	Sinnott (SNT, SNTp)

		ORGANIC							
		mesic forest peat over sand	mesic forest peat over clay	15 to 65 cm of fibric sphagnum peat over mesic forest peat over clay	mesic fen peat over clay	deep mesic forest peat	15 to 65 cm of fibric sphagnum peat over deep mesic forest peat	deep mesic fen peat	15 to 65 cm of fibric sphagnum peat over deep mesic forest peat
Poor to Very Poor	T.M	Rat River (RTVX)	Okno (OKOX)	Orok (OOKX)	Cayer (CAY)	-	-	-	-
	TY.M	-	-	-	-	Baynham (BYHX)	Waskwei (WKWX)	Stead (STD)	Katimik (KMK)

5.1.3 MOISTURE AND NUTRIENT REGIME CLASSIFICATION OF THE BOREAL MIXEDWOOD ECOSYSTEMS

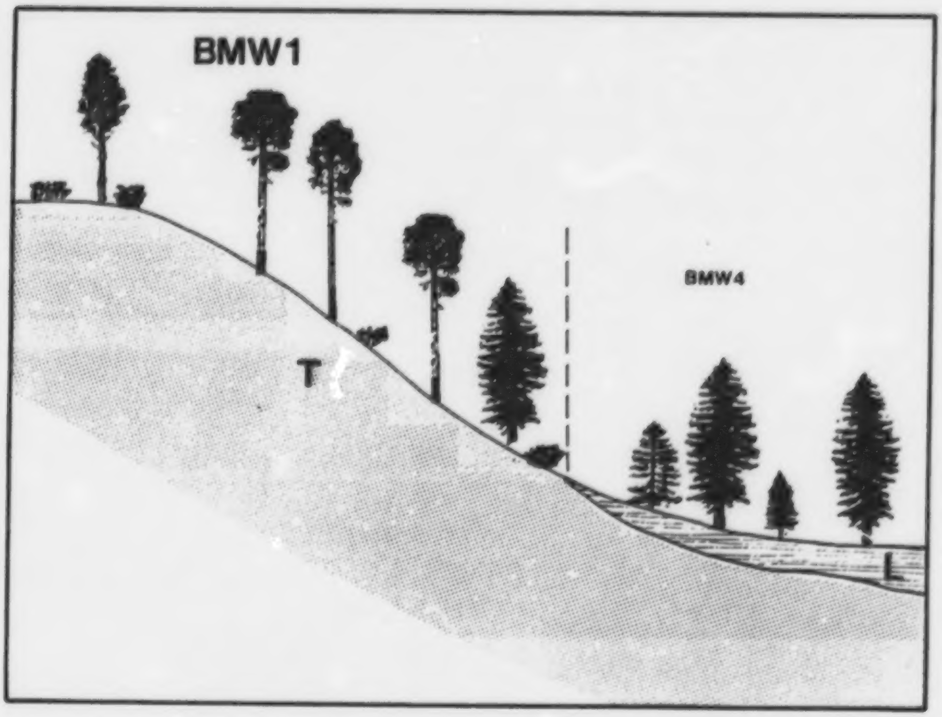

Very xeric A
Xeric B
Subxeric C
Submesic D
Mesic E
Subhygric F
Hygric G
Subhydric H
Hydric I
ECOLOGICAL MOISTURE REGIME (Hygrotope)
TA/ Corylus / Aralia - WTV
JP/ Lycopodium / Pleurozium - WTV
WS/ Viburnum/Aralia - WTV (DKM)
WS/ Hylocomium - VRL
BF - SGU
BS/ Ledum / Pleurozium -/ OKO
WS/ Equisetum - RKH
BS/ Pleurozium - Hylocomium - BKO
BS/ Ledum / Sphagnum - /OKO (BYH)
Unclassified Bogs
Unclassified Fens
A Oligotrophic very poor
B Submesotrophic poor
C Mesotrophic medium
D Permesotrophic rich
E Eutrophic very rich
F Hypereutrophic ext. rich
NUTRIENT REGIME (Trophotope)

BMW 1

TA/Corylus/Aralia - Waitville

(trembling aspen/beaked hazelnut/wild sarsaparilla - Orthic Gray Luvisol/fine loamy till)

SLOPE:	Steep (25-45%)	ASPECT:	South
ELEVATION:	740-800 m	RELIEF:	High



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	SC	M	H	L	JP(TA)	C.BR(N)

TA/Corylus/Aralia - Waitville

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Populus tremuloides (6)

Shrub Layer
- Corylus cornuta (25)
- Prunus pensylvanica (5)
- Rosa spp. (4)
- Amelanchier alnifolia (3)
- Alnus crispa (2)
- Rubus idaeus (2)
- Populus tremuloides (2)
- Symphoricarpos albus (1)
- Picea glauca (1)

Herb and Dwarf Shrub Layer
- Aralia nudicaulis (25)
- Elymus innovatus (10)
- Fragaria virginiana (5)
- Aster ciliolatus (3)
- Cornus canadensis (3)
- Galium boreale (1)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
770 m (739-800)

MEAN MOISTURE REGIME (RANGE):
mesic (submesic-mesic)

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 34 (25-43)

MODAL ASPECT (RANGE): South

SOIL SUBGROUPS:

Dominant:	Brunisolic Gray Luvisols
Associated:	Orthic Eutric Brunisols

SOIL SERIES:

Dominant:	Waitville
Associated:	-

MEAN SOIL DRAINAGE (RANGE): Well

MODAL LANDFORMS:
Hummocky to ridged moraine (till)

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):

TA	11.1 m
WS	23.7 m

MAI (MEAN): 1.5 m3

NUMBER OF PLOTS: 2

SUCCESSIONAL RELATIONSHIPS:

These are seral forests with white spruce as the probable climax species.

SIMILAR FOREST ECOSYSTEMS:

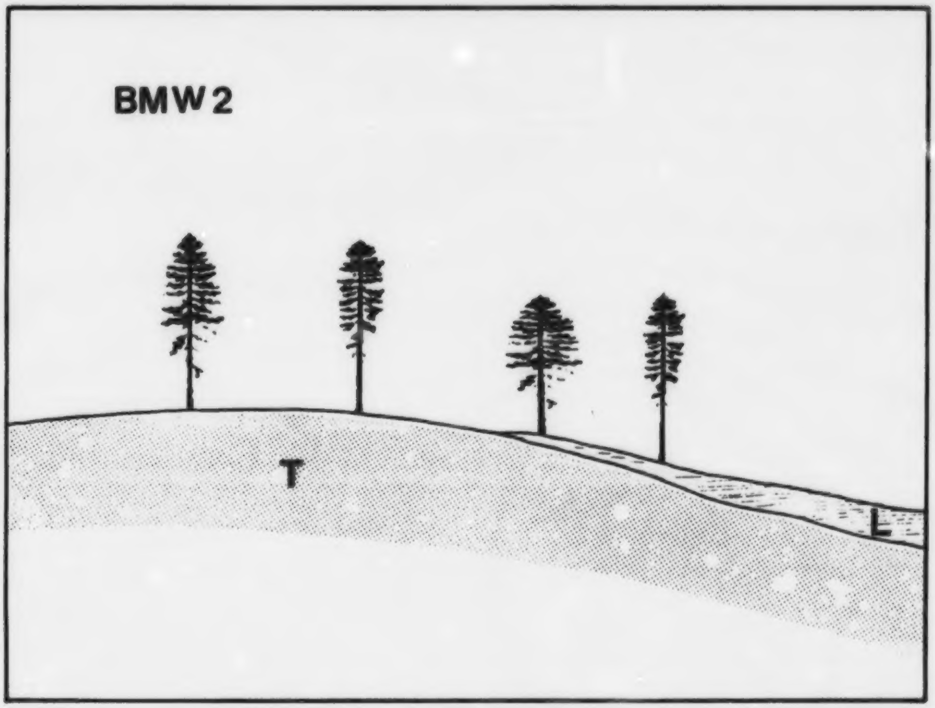
This ecosystem is most similar to *TA/Viburnum/Aralia* (BMW 5b), but is drier and poorer. It corresponds to drier phases of the *Populus-Corylus* Ecosystem of Kabzems et al. (1986).

BMW 2

JP/Lycopodium/Pleurozium - Waitville

(jack pine/club-moss/feather moss - Orthic Gray Luvisol/fine loamy till)

SLOPE:	Moderate (2-9%)	ASPECT:	Variable
ELEVATION:	720-730 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
W	CC	M	M	M	WS, JP	C,BR(N)

JP/Lycopodium/Pleurozium - Waitville

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Pinus banksiana (15)
- Picea mariana (6)
- Betula papyrifera (5)
- Populus tremuloides (5)

Shrub Layer
- Ledum groenlandicum (3)
- Picea mariana (2)
- Alnus crispa (2)
- Abies balsamea (2)
- Viburnum edule (1)
- Vaccinium myrtilloides (1)
- Rosa spp. (1)
- Populus tremuloides (1)
- Rubus idaeus (+)*
- Sorbus decora (+)

Herb and Dwarf Shrub Layer
- Lycopodium annotinum (11)
- Elymus innovatus (7)
- Aralia nudicaulis (7)
- Cornus canadensis (4)
- Linnaea borealis (2)
- Rubus pubescens (2)
- Pyrola asarifolia (2)
- Vaccinium vitis-idaea (2)
- Fragaria virginiana (2)
- Petasites palmatus (1)
- Mertensia paniculata (+)
- Maianthemum canadense (+)
- Trientalis borealis (+)
- Lycopodium complanatum (+)
- Mitella nuda (+)
- Lathyrus ochroleucus (+)

Moss and Lichen Layer
- Pleurozium schreberi (19)
- Hylocomium splendens (8)
- Ptilium crista-castrensis (3)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
718 m (680-747)

MEAN MOISTURE REGIME (RANGE):
Mesic (Submesic-Subhygric)

SOIL pH (CaCl2):

LFH or Organic	-
A Horizon or Organic	5.3
B Horizon or Organic	5.7
C Horizon or Organic	-

MEAN % SLOPE (RANGE): 6 (2-12)

MODAL ASPECT (RANGE): Variable

SOIL SUBGROUPS:

Dominant:	Orthic Gray Luvisols
Associated:	Eluviated Eutric Brunisols

SOIL SERIES:

Dominant:	Waitville
Associated:	Duck Mountain, Rackham, Tee Lake

MEAN SOIL DRAINAGE (RANGE):
Well (well-imperfectly)

MODAL LANDFORMS:
Hummocky moraine (till)

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
JP 15.4 m (13.3-17.2)

MAI (MEAN): 4.3 m3

NUMBER OF PLOTS: 7

SUCCESSIONAL RELATIONSHIPS:

These are mature-seral forests. Black spruce is the probable climax dominant in the sampled plots.

SIMILAR FOREST ECOSYSTEMS:

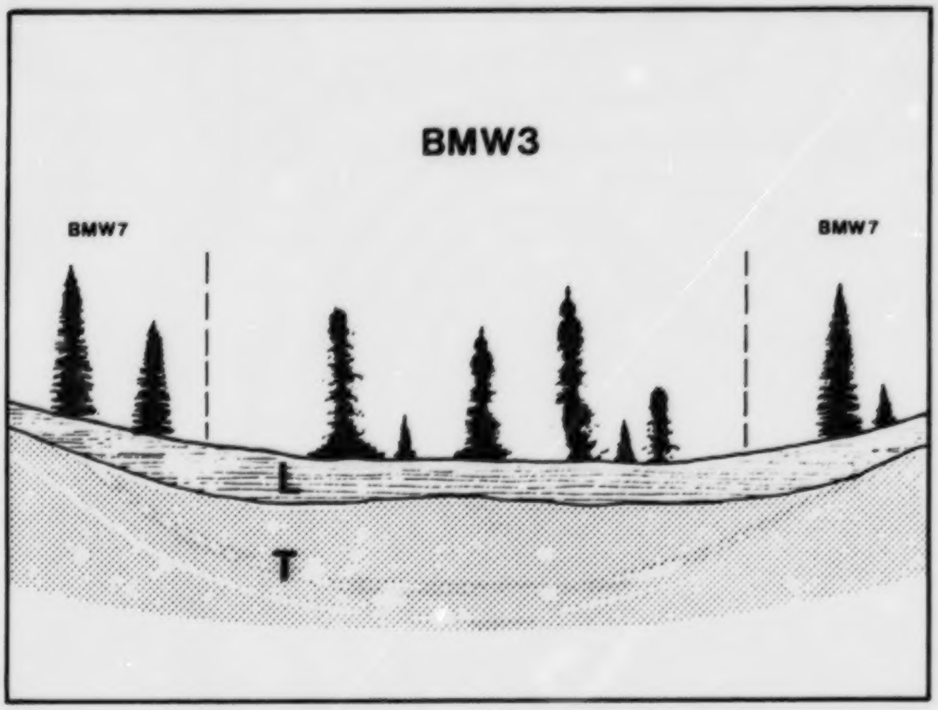
This ecosystem is similar to *JP/Pleurozium* (MBL 12) in the Mid-Boreal Lowlands Ecoregion. It corresponds to the *Pinus-Pleurozium/Lycopodium* Ecosystem of Kabzems et al. (1986).

* + indicates < 1% cover

BMW 3

BS/Pleurozium - Hylocomium - Breckon
(black spruce/feather moss - stairstep moss - Rego Humic Gleysol/clayey glaciolacustrine)

SLOPE:	Gentle (2%)	ASPECT:	Southwest
ELEVATION:	710 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
W	CC	M	H	H	WS	C,BR

BS/Pleurozium - Hylocomium - Breckon

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Picea mariana (25)
- Pinus banksiana (2)

Shrub Layer
- Vaccinium myrtilloides (1)
- Rosa spp. (+)
- Ledum groenlandicum (+)
- Viburnum edule (+)

Herb and Dwarf Shrub Layer
- Cornus canadensis (5)
- Rubus pubescens (2)
- Vaccinium vitis-idaea (2)
- Fragaria virginiana (2)
- Linnaea borealis (1)
- Petasites palmatus (1)
- Aster ciliolatus (1)
- Mertensia paniculata (1)
- Equisetum arvense (+)
- Equisetum sylvaticum (+)

Moss and Lichen Layer
- Pleurozium schreberi (38)
- Hylocomium splendens (23)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
723 m (709-732)

MEAN MOISTURE REGIME (RANGE):
Subhygric (mesic-hygric)

SOIL pH (CaCl2):

LFH or Organic	5.9
A Horizon or Organic	6.4
B Horizon or Organic	6.9
C Horizon or Organic	8.2

MEAN % SLOPE (RANGE): 3 (2-7)

MODAL ASPECT (RANGE): Variable

SOIL SUBGROUPS:

Dominant:	Orthic Luvic and Humic Gleysols
Associated:	Gleyed Gray Luvisols

SOIL SERIES:

Dominant:	Breckon
Associated:	Sinnott, Verrall Lake

MEAN SOIL DRAINAGE (RANGE):
Poorly (imperfectly-poorly)

MODAL LANDFORMS:
Level to undulating glacio-lacustrine blanket over till

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
BS 12.7 m (10.0-15.2)

MAI (MEAN): 3.6 m3

NUMBER OF PLOTS: 3

SUCCESSIONAL RELATIONSHIPS:

This forest ecosystem is successionally mature.

SIMILAR FOREST ECOSYSTEMS:

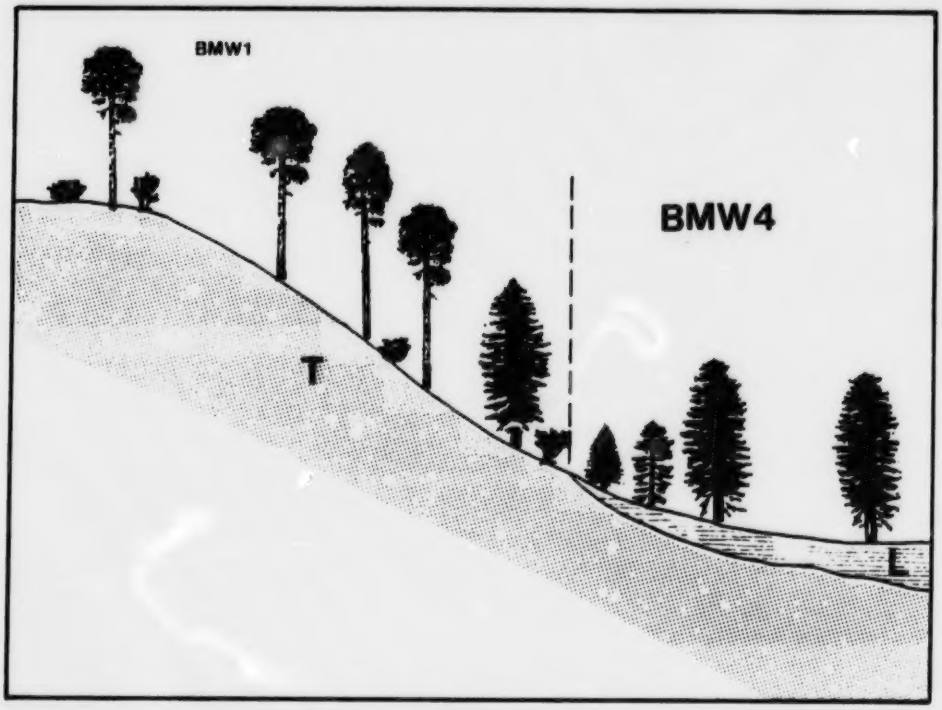
This ecosystem is similar to *BS/Pleurozium-Hylocomium* (MBL 13) in the Mid-Boreal Lowlands Ecoregion. It corresponds to phases of the *Picea mariana-Pleurozium/Hylocomium* and *Picea mariana-Pleurozium/Ptilium* Ecosystems of Kabzems et al. (1986).

BMW 4

WS/Hylocomium - Verrall Lake

(white spruce/stairstep moss - Gleyed Gray Luvisol/clayey glaciolacustrine)

SLOPE:	3-8%	ASPECT:	Northwest
ELEVATION:	720 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	CC	M	H	H	WS	C,BR

WS/Hylocomium - Verrall Lake

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Picea glauca (19)
- Picea mariana (6)

Shrub Layer
- Abies balsamea (14)
- Viburnum edule (1)
- Rosa spp. (+)
- Ribes triste (+)

Herb and Dwarf Shrub Layer
- Aralia nudicaulis (8)
- Rubus pubescens (4)
- Cornus canadensis (4)
- Mertensia paniculata (4)
- Aster ciliolatus (3)
- Linnaea borealis (3)
- Fragaria virginiana (2)
- Pyrola asarifolia (2)
- Petasites palmatus (1)
- Elymus innovatus (+)
- Calamagrostis canadensis (+)
- Galium triflorum (+)
- Lathyrus ochroleucus (+)

Moss and Herb Layer
- Hylocomium splendens (50)
- Pleurozium schreberi (11)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
739 m (720-787)

MEAN MOISTURE REGIME (RANGE):
Mesic (mesic-subhygric)

SOIL pH (CaCl2):

LFH or Organic	5.8
A Horizon or Organic	5.6
B Horizon or Organic	5.9
C Horizon or Organic	8.2

MEAN % SLOPE (RANGE): 14 (3-35)

MODAL ASPECT (RANGE):
Northwest (West-Northeast)

SOIL SUBGROUPS:

Dominant:	Gleyed Gray Luvisol
Associated:	Orthic Gray Luvisol

SOIL SERIES:

Dominant:	Verrall Lake
Associated:	Waitville, Blackstone

MEAN SOIL DRAINAGE (RANGE):
Well (rapidly-moderately well)

MODAL LANDFORMS:
Undulating glaciolacustrine blanket over till

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):

WS	17.4 m (16.2-18.8)
BS	13.2 m

MAI (MEAN): 4.2 m3

NUMBER OF PLOTS: 4

SUCCESSIONAL RELATIONSHIPS:

These forests are successionally mature. Balsam fir is abundant in the understory and may become a significant component of these stands in time.

SIMILAR FOREST ECOSYSTEMS:

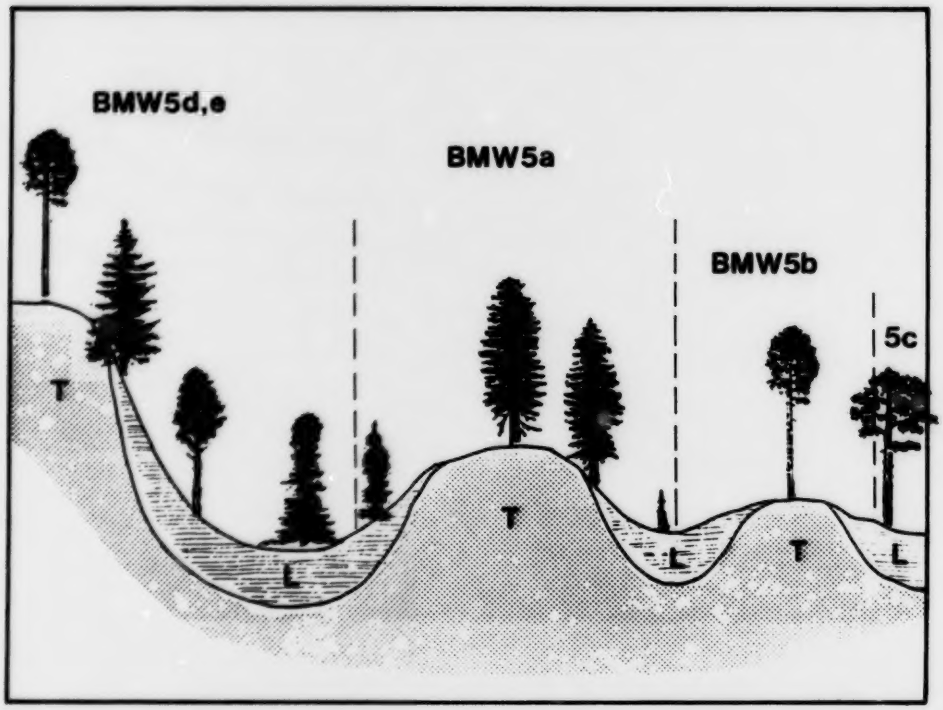
This ecosystem is similar to *WS/Hylocomium* (MBL 10) in the Mid-Boreal Lowlands Ecoregion. Stands with higher shrub and herb cover may be transitional to *WS/Viburnum/Aralia* (BMW 5a). It has affinities with wetter phases of the *Picea glauca-Pleurozium* Ecosystem of Kabzems et al. (1986).

BMW 5a

WS/Viburnum/Aralia - Waitville (Duck Mountain)

(white spruce/low-bush cranberry/wild sarsaparilla - Orthic Gray Luvisol/fine loamy till)
(Orthic Gray Luvisol/clay veneer over till)

SLOPE:	Variable (0-35%)	ASPECT:	Variable
ELEVATION:	Variable (65-790 m)	RELIEF:	Moderate



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
W	CC	M	H	M	WS	C,BR

WS/Viburnum/Aralia - Waitville (Duck Mountain)

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Picea glauca (21)
- Betula papyrifera (6)

Shrub Layer
- Abies balsamea (9)
- Viburnum edule (7)
- Rosa spp. (2)
- Ribes triste (+)
- Sorbus decora (+)

Herb and Dwarf Shrub Layer
- Aralia nudicaulis (17)
- Rubus pubescens (14)
- Cornus canadensis (9)
- Mertensia paniculata (4)
- Aster ciliolatus (3)
- Mitella nuda (4)
- Linnaea borealis (2)
- Fragaria virginiana (1)
- Petasites palmatus (+)
- Pyrola asarifolia (1)
- Viola renifolia (1)
- Galium triflorum (+)
- Lathyrus ochroleucus (+)
- Actea rubra (+)
- Maianthemum canadense (+)
- Galium boreale (+)
- Trientalis borealis (+)
- Equisetum arvense (+)
- Dryopteris spinulosa (+)
- Epilobium angustifolium (+)
- Streptopus amplexifolius (+)

Moss and Lichen Layer
- Plagiomnium drummodii (1)
- Brachythecium populeum (+)
- Ptilium crista-castrensis (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
725 m (655-774)

MEAN MOISTURE REGIME (RANGE):
Mesic (submesic-subhygric)

SOIL pH (CaCl2):

LFH or Organic	5.2
A Horizon or Organic	5.8
B Horizon or Organic	5.8
C Horizon or Organic	7.7

MEAN % SLOPE (RANGE): 12 (1-25)

MODAL ASPECT (RANGE):
Northeast (Northeast-South)

SOIL SUBGROUPS:

Dominant:	Orthic Gray Luvisols
Associated:	Brunisolic Gray Luvisols

SOIL SERIES:

Dominant:	Waitville
Associated:	Duck Mountain, Verrall Lake

MEAN SOIL DRAINAGE (RANGE):
Well (well-moderately well)

MODAL LANDFORMS:
Hummocky moraine with discontinuous glaciolacustrine veneers

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
WS 16.7 m (14.4-19.4)

MAI (MEAN): 4.4 m3

NUMBER OF PLOTS: 8

SUCCESSIONAL RELATIONSHIPS:

This forest ecosystem is successionally mature. Balsam fir is common in the understory and may form a significant component of these stands in time.

SIMILAR FOREST ECOSYSTEMS:

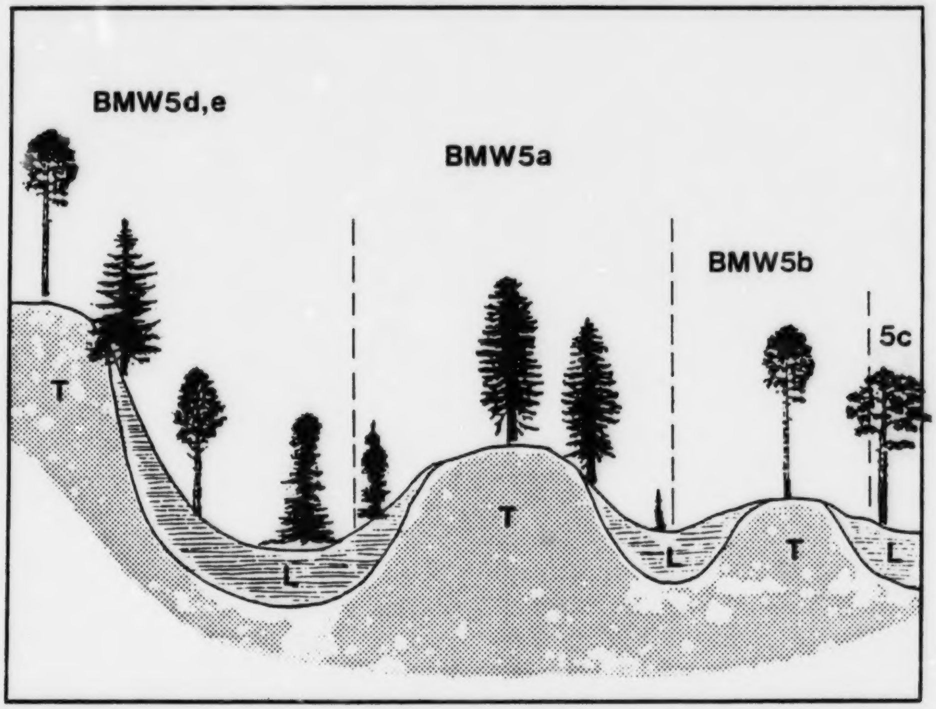
Stands with sparse shrub and herb layers may be similar to *WS/Hylocomium* (BMW 4). This ecosystem has affinities with the *Picea glauca/Populus-Cornus/Mitella* Ecosystem of Kabzems et al. (1986).

BMW 5b

TA/Viburnum/Aralia - Waitville (Duck Mountain)

(trembling aspen/low-bush cranberry/wild sarsaparilla - Orthic Gray Luvisol/fine loamy till)
(Orthic Gray Luvisol/clay veneer over till)

SLOPE:	Variable (0-35%)	ASPECT:	Variable
ELEVATION:	Variable (65-790 m)	RELIEF:	Moderate



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
W	CC	M	H	M	WS(TA)	C,BR(N)

BMW 5b

TA/Viburnum/Aralia - Waitville (Duck Mountain)

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Populus tremuloides (14)
- Populus balsamifera (5)
- Picea mariana (4)
- Picea glauca (2)

Shrub Layer
- Alnus crispa (21)
- Viburnum edule (4)
- Rubus idaeus (2)
- Rosa spp. (1)
- Populus tremuloides (1)
- Salix bebbiana (1)
- Populus balsamifera (1)
- Ledum groenlandicum (+)
- Ribes triste (+)
- Symphoricarpos albus (+)

Herb and Dwarf Shrub Layer
- Aralia nudicaulis (16)
- Rubus pubescens (7)
- Elymus innovatus (5)
- Mertensia paniculata (4)
- Aster ciliolatus (3)
- Calamagrostis canadensis (3)
- Lycopodium annotinum (3)
- Cornus canadensis (2)
- Fragaria virginiana (2)
- Epilobium angustifolium (1)
- Petasites palmatus (1)
- Pyrola asarifolia (1)
- Actea rubra (+)
- Galium boreale (+)
- Maianthemum canadense (+)
- Galium triflorum (+)

Moss and Lichen Layer
- Brachythecium populeum (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
729 m (723-732)

MEAN MOISTURE REGIME (RANGE):
Mesic (mesic-subhygric)

SOIL pH (CaCl2):

LFH or Organic	4.7
A Horizon or Organic	4.3
B Horizon or Organic	4.1
C Horizon or Organic	7.3

MEAN % SLOPE (RANGE): 3 (2-4)

MODAL ASPECT (RANGE): Variable

SOIL SUBGROUPS:
Dominant: Orthic Gray Luvisols
Associated: Gleyed Gray Luvisols, Humic Luvic Gleysols

SOIL SERIES:
Dominant: Duck Mountain
Associated: Waitville, Singush, Breckon

MEAN SOIL DRAINAGE (RANGE):
Well (well-moderately well)

MODAL LANDFORMS:
Hummocky moraine with discontinuous glaciolacustrine veneers

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):

TA	17.1 m (16.5-17.8)
WS	14.7 m
BS	11.6 m
BPO	15.3 m

MAI (MEAN): 2.4 m3

NUMBER OF PLOTS: 6

SUCCESSIONAL RELATIONSHIPS:

These forests are successionally seral. Development toward a *WS/Viburnum/Aralia* association may be expected.

SIMILAR FOREST ECOSYSTEMS:

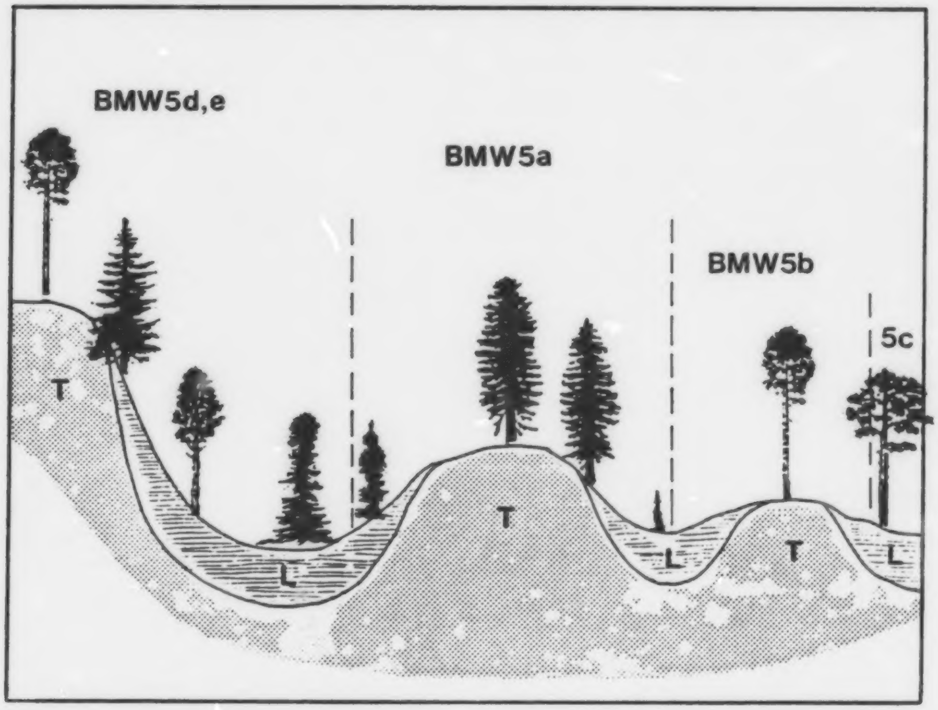
This ecosystem is most similar to *Populus/Corylus/Aralia* (MBL 5a) in the Mid-Boreal Lowlands Ecoregion. It has affinities with the *Populus-Aralia/Linnaea* Ecosystem of Kabzems et al. (1986).

BMW 5c

BPO/Viburnum/Aralia - Waitville (Duck Mountain)

(balsam poplar/low-bush cranberry/wild sarsaparilla - Orthic Gray Luvisol/fine loamy till)
(Orthic Gray Luvisol/clay veneer over till)

SLOPE:	Variable (0-35%)	ASPECT:	Variable
ELEVATION:	Variable (65-790 m)	RELIEF:	Moderate



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	CC	M	H	M	WS	C,BR

BPO/Viburnum/Aralia - Waitville (Duck Mountain)

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Populus balsamifera (18)
- Picea mariana (9)
- Picea glauca (3)

Shrub Layer
- Viburnum edule (30)
- Alnus crispa (12)
- Rubus idaeus (5)
- Corylus cornuta (1)
- Populus balsamifera (1)
- Rosa spp. (1)

Herb and Dwarf Shrub Layer
- Aralia nudicaulis (25)
- Rubus pubescens (20)
- Lycopodium annotinum (8)
- Viola renifolia (5)
- Mertensia paniculata (4)
- Aster ciliolatus (3)
- Calamagrostis canadensis (3)
- Cornus canadensis (3)
- Fragaria virginiana (2)
- Mitella nuda (2)
- Epilobium angustifolium (1)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
692 m

MEAN MOISTURE REGIME (RANGE):
Mesic

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 9

MODAL ASPECT (RANGE): East

SOIL SUBGROUPS:

Dominant:	Orthic Gray Luvisols
Associated:	-

SOIL SERIES:

Dominant:	Waitville
Associated:	-

MEAN SOIL DRAINAGE (RANGE): Well

MODAL LANDFORMS:
Hummocky moraine with discontinuous glaciolacustrine veneers

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
BPO 14.5 m

MAI (MEAN): 3.1 m3

NUMBER OF PLOTS: 1

SUCCESSIONAL RELATIONSHIPS:

These forests are successionally seral. Dominance by black spruce and/or white spruce is expected.

SIMILAR FOREST ECOSYSTEMS:

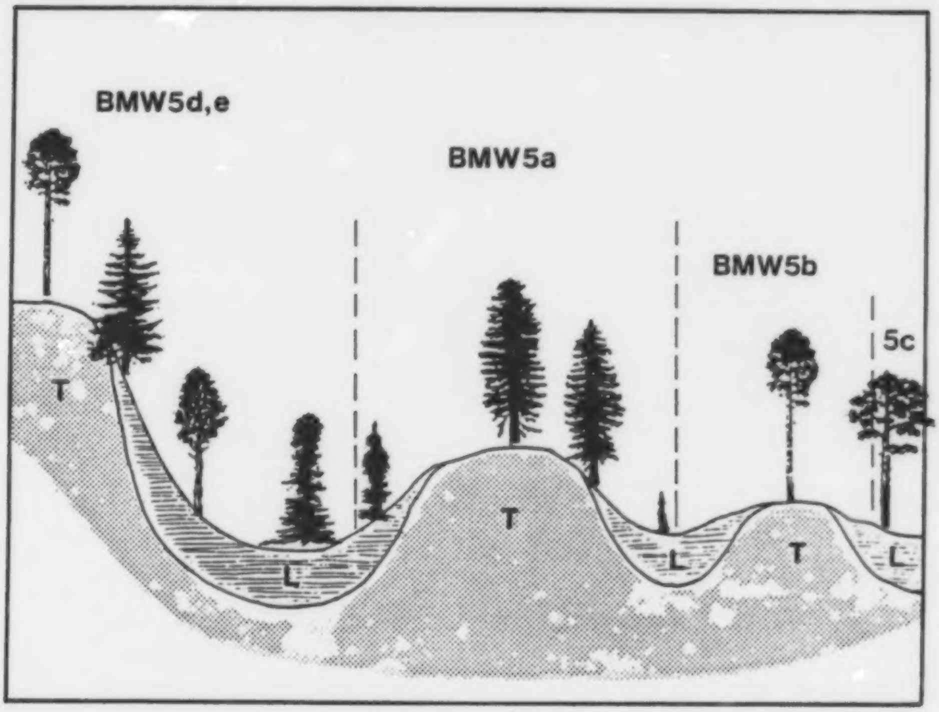
This ecosystem is most similar to *Populus/Corylus/Aralia* (MBL 5a) in the Mid-Boreal Lowlands Ecoregion. It has affinities with the *Populus-Aralia/Linnaea* Ecosystem of Kabzems et al. (1986).

BMW 5d

WB/Viburnum/Aralia - Waitville (Duck Mountain)

(white birch/low-bush cranberry/wild sarsaparilla - Orthic Gray Luvisol/fine loamy till)
(Orthic Gray Luvisol/clay veneer over till)

SLOPE:	Variable (0-35%)	ASPECT:	Variable
ELEVATION:	Variable (65-790 m)	RELIEF:	Moderate



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	CC	M	H	M	WS	C,BR

BMW 5d

WB/Viburnum/Aralia - Waitville (Duck Mountain)

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Betula papyrifera (22)
- Picea mariana (8)
- Populus tremuloides (6)
- Picea glauca (1)

Shrub Layer
- Viburnum edule (6)
- Populus tremuloides (+)
- Abies balsamea (+)
- Rosa spp. (+)
- Ribes triste (+)
- Sorbus decora (+)

Herb and Dwarf Shrub Layer
- Aralia nudicaulis (24)
- Rubus pubescens (6)
- Lycopodium annotinum (5)
- Cornus canadensis (4)
- Pyrola asarifolia (2)
- Mitella nuda (2)
- Calamagrostis canadensis (2)
- Aster ciliolatus (2)
- Mertensia paniculata (1)
- Linnaea borealis (1)
- Petasites palmatus (1)
- Trientalis borealis (+)
- Galium triflorum (+)
- Maianthemum canadense (+)
- Actea rubra (+)
- Pyrola secunda (+)

Moss and Lichen Layer
- Hylocomium splendens (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
761 m (739-793)

MEAN MOISTURE REGIME (RANGE):
Mesic

SOIL pH (CaCl2):

LFH or Organic	5.9
A Horizon or Organic	5.3
B Horizon or Organic	6.1
C Horizon or Organic	7.4

MEAN % SLOPE (RANGE):
13 (0-35)

MODAL ASPECT (RANGE): Variable

SOIL SUBGROUPS:
Dominant: Orthic Gray Luvisols
Associated: Dark Gray Luvisols

SOIL SERIES:
Dominant: Waitville
Associated: Duck Mountain, Blackstone

MEAN SOIL DRAINAGE (RANGE):
Well (well-moderately well)

MODAL LANDFORMS:
Hummocky moraine with discontinuous glaciolacustrine veneers

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):

WB	13.9 m (13.8-14.0)
BS	12.8 m (11.7-13.7)
TA	15.7 m (15.1-16.4)
WS	15.9 m

MAI (MEAN): 3.8 m3

NUMBER OF PLOTS: 8

SUCCESSIONAL RELATIONSHIPS:

This forest ecosystem is successionally seral. White and/or black spruce is the expected climax dominant.

SIMILAR FOREST ECOSYSTEMS:

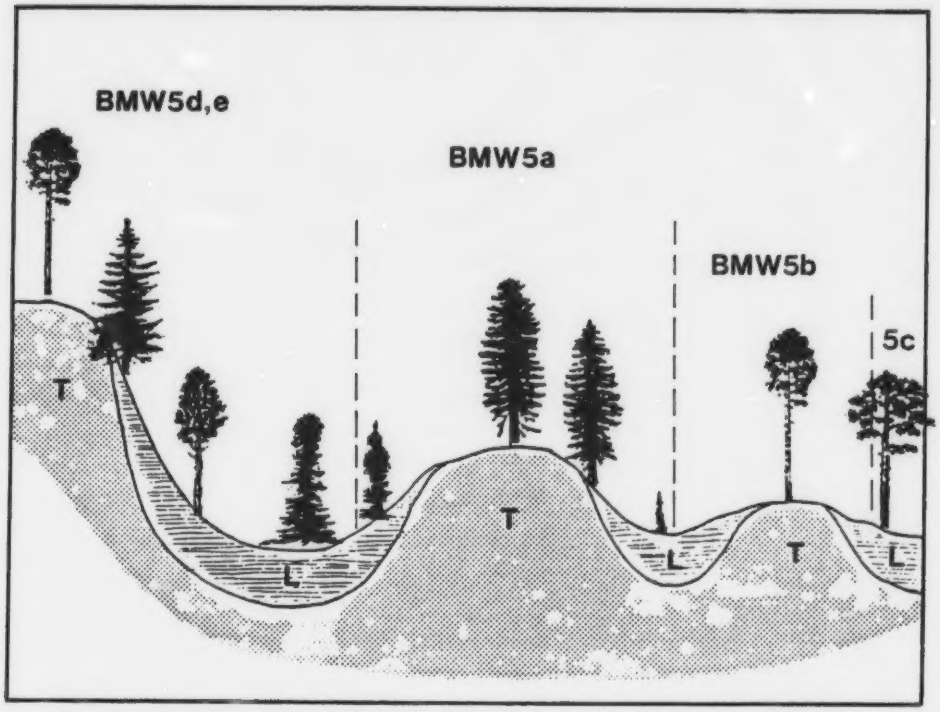
This ecosystem is most similar to *WB/Corylus/Aralia* (MBL 5b) in the Mid- Boreal Lowlands Ecoregion.

BMW 5e

BS/Viburnum/Aralia - Waitville (Duck Mountain)

(black spruce/low-bush cranberry/wild sarsaparilla - Orthic Gray Luvisol/fine loamy till)
(Orthic Gray Luvisol/clay veneer over till)

SLOPE:	Variable (0-35%)	ASPECT:	Variable
ELEVATION:	Variable (65-790 m)	RELIEF:	Moderate



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
W	CC	M	H	M	WS	C,BR

BS/Viburnum/Aralia - Waitville (Duck Mountain)

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Picea mariana (17)
- Populus tremuloides (8)
- Betula papyrifera (3)
- Pinus banksiana (2)

Shrub Layer
- Abies balsamea (3)
- Populus tremuloides (2)
- Vaccinium myrtilloides (2)
- Viburnum edule (+)
- Rosa spp. (+)
- Rubus idaeus (+)

Herb and Dwarf Shrub Layer
- Linnaea borealis (3)
- Aralia nudicaulis (2)
- Rubus pubescens (2)
- Cornus canadensis (2)
- Lycopodium annotinum (2)
- Aster ciliolatus (2)
- Mertensia paniculata (+)
- Lathyrus ochroleucus (+)
- Maianthemum canadense (+)
- Petasites palmatus (+)
- Pyrola asarifolia (+)
- Galium triflorum (+)
- Pyrola secunda (+)

Moss and Lichen Layer
- Hylocomium splendens (2)
- Pleurozium schreberi (1)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
758 m (729-777)

MEAN MOISTURE REGIME (RANGE):
Mesic

SOIL pH ($CaCl_2$):

LFH or Organic	6.7
A Horizon or Organic	-
B Horizon or Organic	5.5
C Horizon or Organic	8.4

MEAN % SLOPE (RANGE): 11 (2-22)

MODAL ASPECT (RANGE):
South (Southeast-Southwest)

SOIL SUBGROUPS:

Dominant:	Orthic Gray Luvisols
Associated:	Gleyed Gray Luvisols

SOIL SERIES:

Dominant:	Waitville
Associated:	Blackstone, Singush

MEAN SOIL DRAINAGE (RANGE):
Moderately well (well-imperfectly)

MODAL LANDFORMS:
Hummocky moraine with discontinuous glaciolacustrine veneers

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):

BS	14.0 m (13.5-14.5)
WS	14.3 m
JP	14.0 m

MAI (MEAN): 4.0 m3

NUMBER OF PLOTS: 4

SUCCESSIONAL RELATIONSHIPS:

These forests are successionally mature. Balsam fir is common in the understory and may become a significant component of these stands.

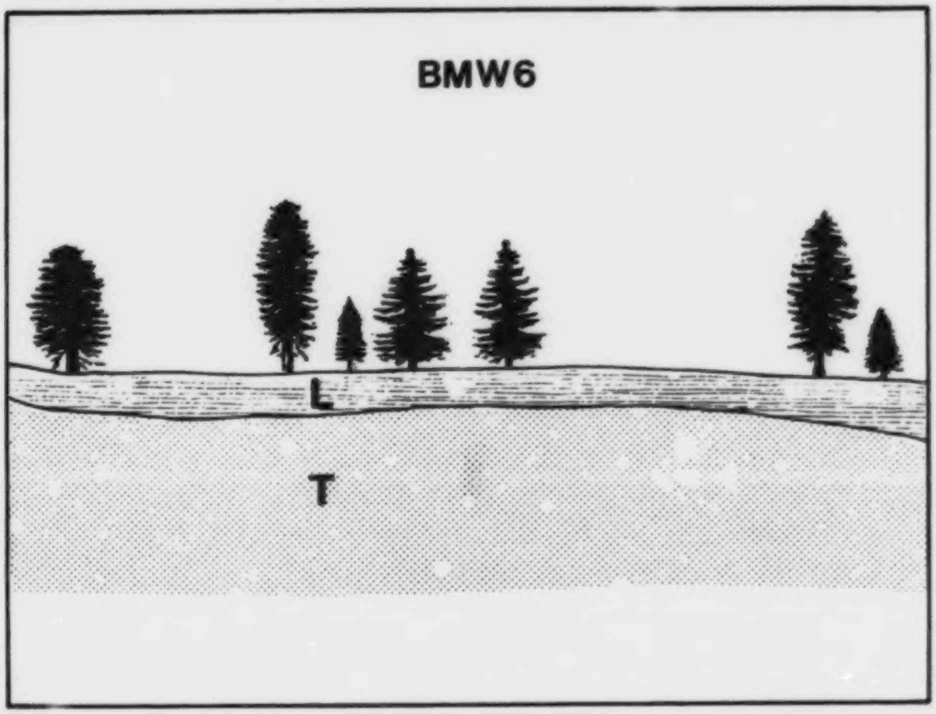
SIMILAR FOREST ECOSYSTEMS:

Stands with better developed moss cover, usually on wetter sites, may be transitional to *BS/Pleurozium-Hylocomium* (BMW 3).

BMW 6

WS/Equisetum - Rackham
(white spruce/horsetail - Orthic Gray Luvisol/loamy glaciolacustrine)

SLOPE:	3%	ASPECT:	Northeast
ELEVATION:	730 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
W	CC	M	H	M	WS	C.BR

WS/Equisetum - Rackham

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Populus tremuloides (16)
- Picea glauca (13)
- Picea mariana (3)
- Abies balsamea (1)

Shrub Layer
- Abies balsamea (4)
- Rubus idaeus (3)
- Alnus rugosa (1)

Herb and Dwarf Shrub Layer
- Aster ciliolatus (20)
- Equisetum arvense (18)
- Mertensia paniculata (5)
- Rubus pubescens (4)
- Fragaria virginiana (3)
- Viola renifolia (3)
- Equisetum sylvaticum (2)
- Agropyron repens (1)
- Aralia nudicaulis (1)
- Mitella nuda (1)
- Petasites palmatus (1)

Moss and Lichen Layer
- Bracythecium populeum (4)
- Plagiomnium drummondii (3)
- Thuidium recognitum (1)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 732 m

MEAN MOISTURE REGIME (RANGE):
Subhygric

SOIL pH (CaCl2):

LFH or Organic	-
A Horizon or Organic	5.5
B Horizon or Organic	-
C Horizon or Organic	-

MEAN % SLOPE (RANGE): 3

MODAL ASPECT (RANGE):
Northeast

SOIL SUBGROUPS:

Dominant:	Orthic Gray Luvisols
Associated:	-

SOIL SERIES:

Dominant:	Rackham
Associated:	-

MEAN SOIL DRAINAGE (RANGE):
Imperfectly

MODAL LANDFORMS:
Gently undulating glaciolacustrine blanket

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
WS 16.4 m

MAI (MEAN): 6.5 m3

NUMBER OF PLOTS: 1

SUCCESSIONAL RELATIONSHIPS:

This forest ecosystem is successionally mature. Balsam fir may become a significant component of these stands in the future.

SIMILAR FOREST ECOSYSTEMS:

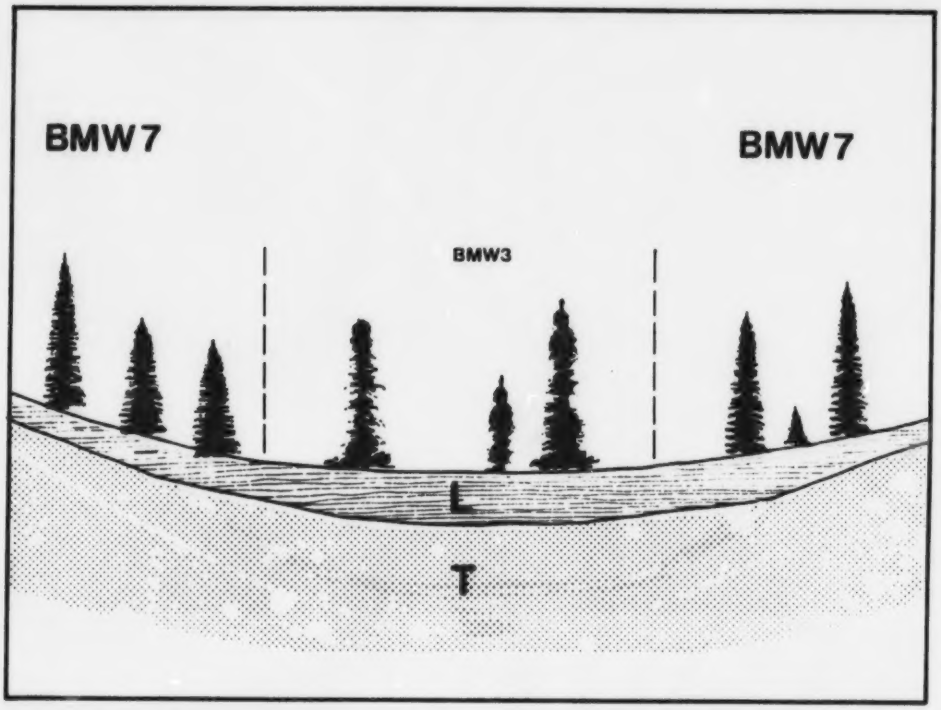
This ecosystem was rare in the study area and was not closely similar to the other ecosystems. It has affinities with the *Picea glauca-Equisetum* Ecosystem of Kabzems et al. (1986).

BMW 7

BF - Singush

(balsam fir - Gleyed Gray Luvisol/clay veneer over till)

SLOPE:	2-5%	ASPECT:	Variable
ELEVATION:	648 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
W	CC	M	H	M	WS	C,BR

BF - Singush

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Abies balsamea (44)
- Betula papyrifera (6)

Shrub Layer
- Abies balsamea (2)

Herb and Dwarf Shrub Layer
- Aralia nudicaulis (1)
- Cornus canadensis (1)
- Mitella nuda (1)
- Rubus pubescens (1)

Moss and Lichen Layer
- Drepanocladus uncinatus (7)
- Splachnum spp. (7)
- Brachythecium populeum (1)
- Hylocomium splendens (1)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 648 m

MEAN MOISTURE REGIME (RANGE):
Mesic

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 5

MODAL ASPECT (RANGE):
East

SOIL SUBGROUPS:

Dominant:	Dark Gray Luvisols
Associated:	-

SOIL SERIES:

Dominant:	Singush
Associated:	-

MEAN SOIL DRAINAGE (RANGE):
Moderately well

MODAL LANDFORMS:
Undulating glaciolacustrine veneer over till

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
BF 11.1 m

MAI (MEAN): 5.3 m3

NUMBER OF PLOTS: 1

SUCCESSIONAL RELATIONSHIPS:

These forests are successionally mature.

SIMILAR FOREST ECOSYSTEMS:

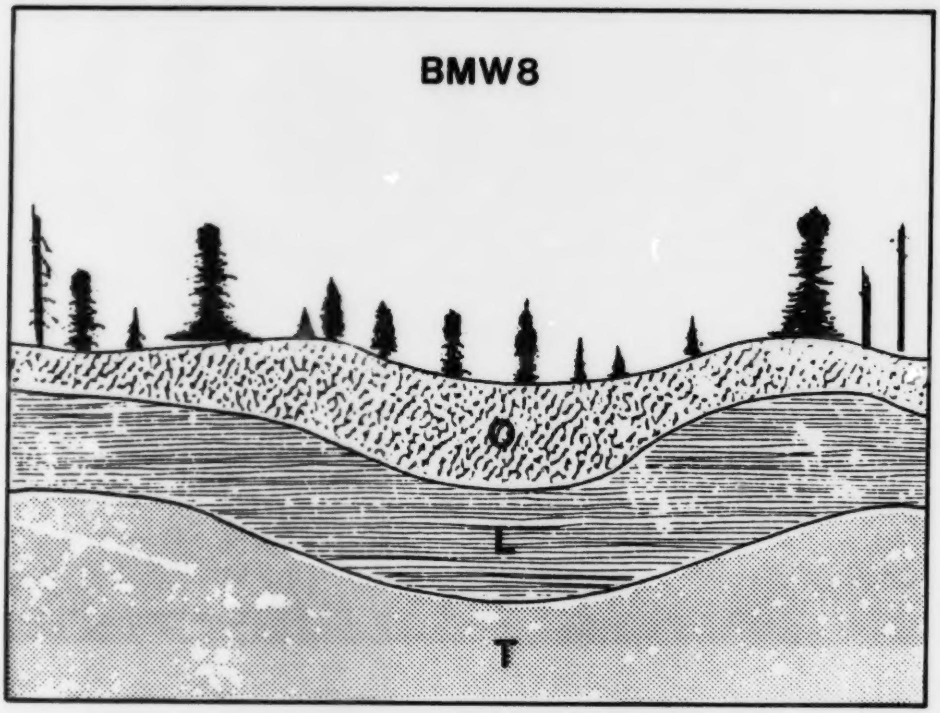
This ecosystem is most similar to *BF* (MBL 9) in the Mid-Boreal Lowlands Ecoregion.

BMW 8

BS/Ledum/Pleurozium - Okno

(black spruce/labrador tea/feather moss - Terric Mesisol/mesic peat over clay

SLOPE:	0-1%	ASPECT:	Level
ELEVATION:	720-777 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
-	L	peat	-	H	BS	C

BMW 8

BS/Ledum/Pleurozium - Okno

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Picea mariana (21)

Shrub Layer
- Ledum groenlandicum (8)
- Picea mariana (3)
- Alnus rugosa (2)

Herb and Dwarf Shrub Layer
- Rubus chamaemorus (2)
- Oxycoccus quadripetalus (1)
- Cornus canadensis (+)
- Equisetum scirpoides (+)
- Geocaulon lividum (+)
- Habenaria obtusata (+)
- Habenaria orbiculata (+)
- Smilacina trifolia (+)
- Vaccinium vitis-idaea (+)

Moss and Lichen Layer
- Pleurozium schreberi (67)
- Hylocomium splendens (13)
- Sphagnum nemoreum (8)
- Ptilium crista-castrensis (4)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
745 m (720-777)

MEAN MOISTURE REGIME (RANGE):
Subhydric (subhydric-hydric)

SOIL pH (CaCl2):

LFH or Organic	7.0
A Horizon or Organic	6.8
B Horizon or Organic	6.2
C Horizon or Organic	6.1

MEAN % SLOPE (RANGE): 0 (0-1)

MODAL ASPECT (RANGE): level

SOIL SUBGROUPS:

Dominant:	Typic and Terric Mesisols
Associated:	Peaty Humic Gleysols

SOIL SERIES:

Dominant:	Okno
Associated:	Baynham, Sinnott, Waskwei

MEAN SOIL DRAINAGE (RANGE):
Poorly (poorly-very poorly)

MODAL LANDFORMS:
Organic

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
BS 9.7 m (8.7-12.8)

MAI (MEAN): 1.7 m3

NUMBER OF PLOTS: 6

SUCCESSIONAL RELATIONSHIPS:

This forest ecosystem is successionally mature.

SIMILAR FOREST ECOSYSTEMS:

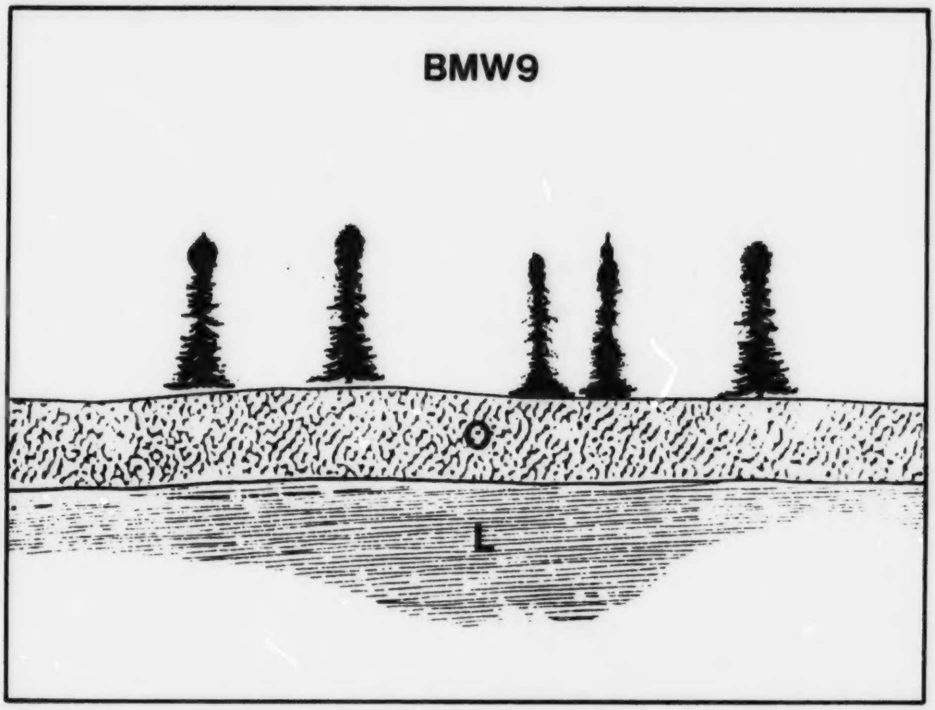
This ecosystem is most similar to *BS/Ledum/Sphagnum* (BMW 9), which has higher *Sphagnum* cover and lesser *Pleurozium* cover. It corresponds to phases of the *Larix/Picea mariana-Ledum/Pleurozium* and *Picea mariana-Ledum/Carex* Ecosystems of Kabzems et al. (1986).

BMW 9

BS/Ledum/Sphagnum - Okno

(black spruce/labrador tea/peat moss - Terric Mesisol/mesic peat over clay)

SLOPE:	0%	ASPECT:	Level
ELEVATION:	733 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
-	L	peat	-	H	BS	C

BS/Ledum/Sphagnum - Okno

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
  Picea mariana (12)

Shrub Layer
  Ledum groenlandicum (18)
  Picea mariana (3)
  Alnus rugosa (2)
  Salix spp. (2)

Herb and Dwarf Shrub Layer
  Rubus chamaemorus (20)
  Oxycoccus quadripetalus (3)
  Calamagrostis canadensis (1)
  Carex disperma (1)
  Cornus canadensis (1)
  Smilacina trifolia (1)
  Vaccinium vitis-idaea (1)

Moss and Lichen Layer
  Pleurozium schreberi (40)
  Sphagnum magellanicum (31)
  Sphagnum fuscum (24)
  Calliergon richardsonii (1)
  Hylocomium splendens (1)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 733 m

MEAN MOISTURE REGIME (RANGE):
  Subhydric

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 0

MODAL ASPECT (RANGE): -

SOIL SUBGROUPS:

Dominant:	Terric Mesisols
Associated:	-

SOIL SERIES:

Dominant:	Okno
Associated:	-

MEAN SOIL DRAINAGE (RANGE):
  Poorly

MODAL LANDFORMS:
  Organic

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
  BS 8.3 m

MAI (MEAN): 0.8 m3

NUMBER OF PLOTS: 1

SUCCESSIONAL RELATIONSHIPS:

These forests are successionally mature.

SIMILAR FOREST ECOSYSTEMS:

This ecosystem is most similar to *BS/Ledum/Sphagnum* (MBL 11) of the Mid-Boreal Lowlands Ecoregion. It is also similar to *BS/Ledum/Pleurozium* (BMW 8). It corresponds to the *Picea mariana-Ledum/Sphagnum* Ecosystem of Kabzems et al. (1986).

5.2 FOREST ECOSYSTEMS OF THE MID-BOREAL LOWLANDS

5.2.1 KEY TO THE FOREST ECOSYSTEMS OF THE MID-BOREAL LOWLANDS - SUBREGIONS 20.13 AND 20.14

CODE	FOREST ECOSYSTEM (PLANT ASSOCIATION - SOIL SERIES)
MBL 1	JP/Hudsonia/Lichen - Kettlehills
MBL 2a	JP/Amelanchier/Arctostaphylos - Pine Ridge
MBL 2b	TA/Amelanchier/Arctostaphylos - Wood Ridge
MBL 3	JP/Ledum/Linnaea - Kerry
MBL 4	JP/Vaccinium - Lonesand
MBL 5a	Populus/Corylus/Aralia - Pine Ridge/Waitville
MBL 5b	WB/Corylus/Aralia - Pine Ridge/Waitville
MBL 5c	JP/Corylus/Aralia - Waitville
MBL 6	TA/Acer - Duck Mountain
MBL 7	Picea/Cornus stolonifera - Novra
MBL 8a	BPO/Acer/Matteucia - Homestead
MBL 8b	WB/Acer/Matteucia - Homestead
MBL 8c	WE/Acer/Matteucia - Homestead
MBL 9	BF - Waitville
MBL 10	WS/Hylocomium - Novra
MBL 11	BS/Ledum/Sphagnum - Kircro
MBL 12	JP/Pleurozium - Waitville
MBL 13	BS/Pleurozium - Hylocomium - Meleb

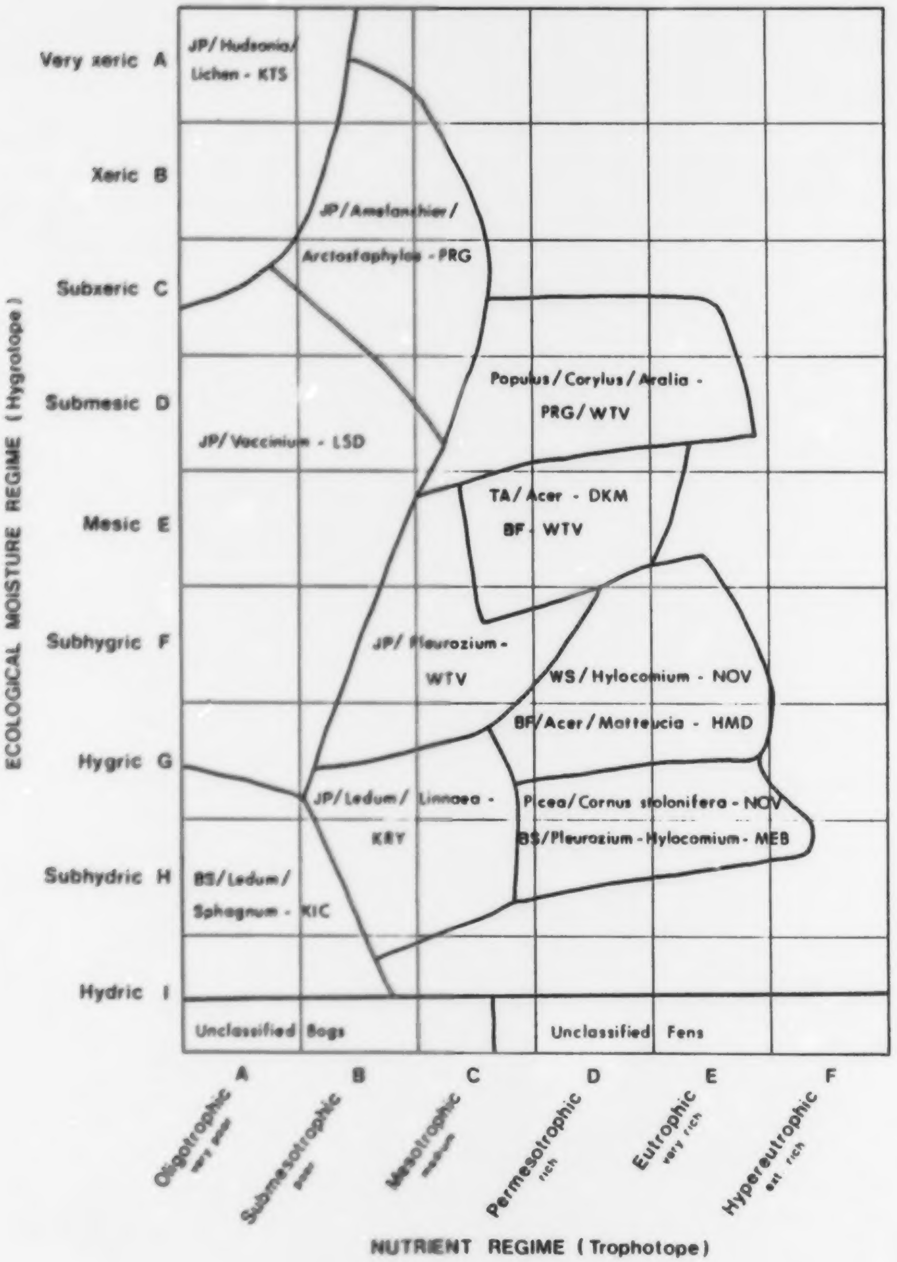
TA	-	trembling aspen
JP	-	jackpine
BS	-	black spruce
WS	-	white spruce
BPO	-	balsam poplar
WB	-	white birch
BF	-	balsam fir
WE	-	white elm

5.2.2 KEY TO THE SOILS OF THE MID-BOREAL LOWLANDS - SUBREGIONS: 20.13 AND 20.14

DRAINAGE GROUP	SOIL SUBGROUP	RECENT FLUVIAL	GLACIOFLUVIAL FANS AND BEACH DEPOSITS				
		fine sandy-loamy, moderately-strongly calcareous	sandy, gravelly Fans, strongly calcareous	sandy, coarse loamy, weak to mod. calc. Fans	fine sand-sand, non calcareous beach ridges	duned fine sand	sandy-coarse loamy over till
Well	O.R	-	-	-	-	Kettlehills (KTS)	-
	E.DYB	-	-	-	Sandilands (SDI)	-	-
	O.GL/E.EB	-	-	Pine Ridge (PRG)	-	-	-
	O.GL	-	Woodridge (WOG)	-	-	-	-
Imperfectly	GLE.DYB	-	-	-	Lonesand (LSD)	-	-
	GLE.EB	-	-	Wintergreen (WGE)	-	-	-
	GLCU.R	Homestead (HMD)	-	-	-	-	-
	GL.GL	-	-	-	-	-	Caliento (CLO)
Poorly	R.G	Novra (NOV)	Sundown (SUW)	-	Kerry (KRY)	-	-
	R.HG	-	-	Malonton (MNT)	-	-	-

		ORGANIC		
		0.4 to 1.6 m mesic peat over sand	mesic forest peat over sand	1.0 to 1.5 m fibric peat over 0.1 to 0.6 m mesic/sand
Very Poorly	T.M	Kircro (KIC)	Rat River (RTV)	-
	TME.F	-	-	Sand River (SDV)

5.2.3 MOISTURE AND NUTRIENT REGIME CLASSIFICATION OF THE MID-BOREAL LOWLANDS ECOSYSTEMS

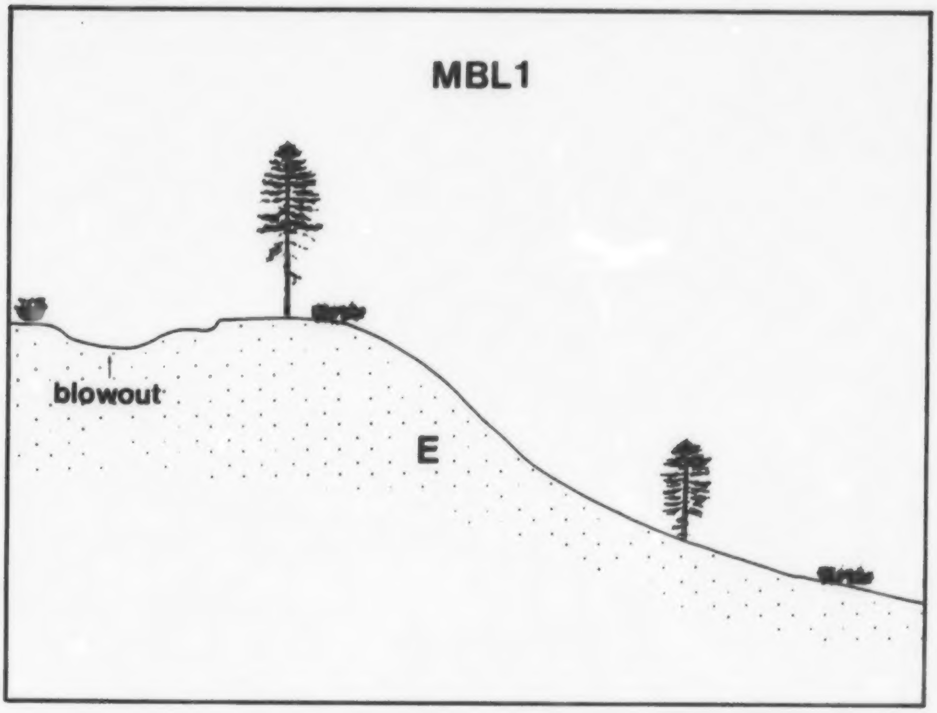


MBL 1

JP/Hudsonia/Lichen - Kettlehills

(jack pine/false heather/lichen - Orthic Regosol/duned fine sand)

SLOPE:	4-10%	ASPECT:	East
ELEVATION:	350 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
-	L	L	wind	L	JP	C

JP/Hudsonia/Lichen - Kettlehills

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
  Pinus banksiana (3)

Shrub Layer
  Pinus banksiana (7)
  Salix spp. (+)

Herb and Dwarf Shrub Layer
  Hudsonia tomentosa (31)
  Arctostaphylos uva-ursi (+)
  Festuca saximontana (+)
  Koeleria cristata (+)
  Solidago decumbens (+)
  Solidago hispida (+)

Moss and Lichen Layer
  Cladina mitis (15)
  Cladonia gracilis (6)
  Polytrichum juniperinum (2)
  Ceratodon purpureus (1)
  Cladonia cristatella (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 351 m

MEAN MOISTURE REGIME (RANGE):
  Subxeric (xeric-subxeric)

SOIL pH (CaCl2):

LFH or Organic	-
A Horizon or Organic	5.0
B Horizon or Organic	5.0
C Horizon or Organic	-

MEAN % SLOPE (RANGE): 5 (0-10)

MODAL ASPECT (RANGE):
  East (level-East)

SOIL SUBGROUPS:

Dominant:	Eluviated Dystric and Orthic Brunisols
Associated:	Orthic Regosols

SOIL SERIES:

Dominant:	Kettlehills
Associated:	Sandilands

MEAN SOIL DRAINAGE (RANGE):
  Rapidly

MODAL LANDFORMS:
  Duned beach sands (eolian or glaciofluvial) and ridged glaciofluvial outwash

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
  JP 13.7 m (11.6-16.4)

MAI (MEAN): 0.1 m3

NUMBER OF PLOTS: 3

SUCCESSIONAL RELATIONSHIPS:

These are young edaphic climax forests. Jack pine will continue to dominate. As the dunes become more stable, lichens may replace the beach-heath (Hudsonia).

SIMILAR FOREST ECOSYSTEMS:

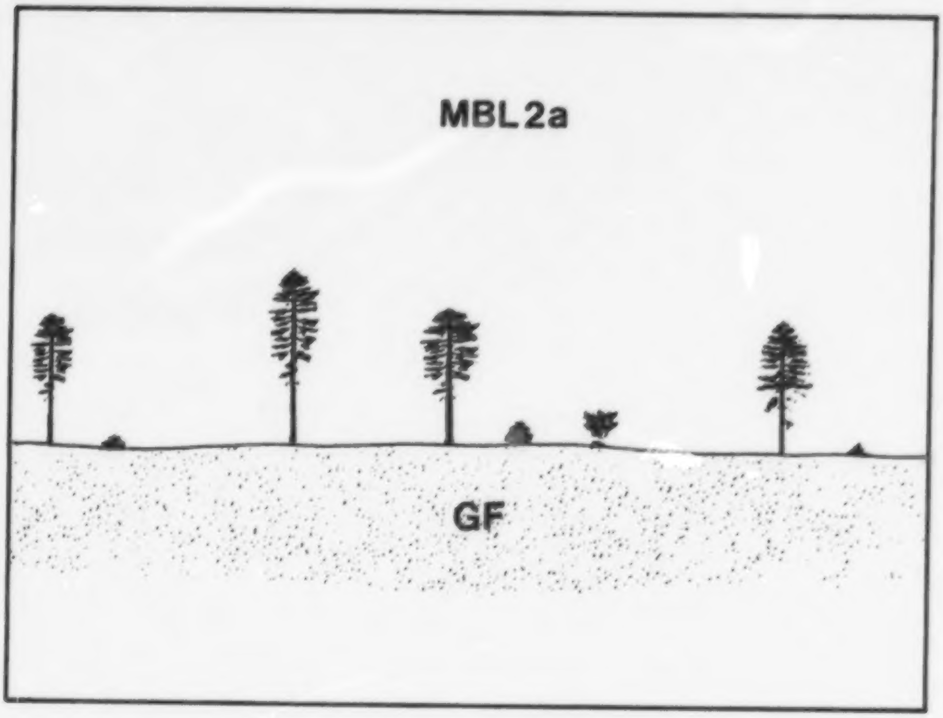
This ecosystem occurs on active and stable stand dunes. It is most similar to *JP/Vaccinium* (MBL 4) that occurs in swales between the dunes.

MBL 2a

JP/Amelanchier/Arctostaphylos - Pine Ridge/Sandilands

(jack pine/saskatoon-berry/bearberry - Orthic Gray Luvisol/Eluviated Eutric Brunisol/ sandy-coarse loamy glaciofluvial fans or on beach ridges)

SLOPE:	0%	ASPECT:	Level
ELEVATION:	360-430 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
A	CC,SC	L	L	L	JP	C

MBL 2a

JP/Amelanchier/Arctostaphylos - Pine Ridge/Sandilands

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
Pinus banksiana (17)

Shrub Layer
Amelanchier alnifolia (6)
Rosa sp. (6)
Symphoricarpos albus (4)
Alnus crispa (2)
Vaccinium myrtilloides (2)
Lonicera dioica (+)
Shepherdia canadensis (+)

Herb and Dwarf Shrub Layer
Arctostaphylos uva-ursi (9)
Linnaea borealis (5)
Elymus innovatus (3)
Fragaria virginiana (2)
Maianthemum canadense (2)
Aster laevis (1)
Erigeron glabellus (1)
Schizachne purpurascens (1)
Lathyrus ochroleucus (+)
Solidago hispida (+)
Galium boreale (+)

Moss and Lichen Layer
Pleurozium schreberi (18)
Cladina mitis (8)
Hylocomium splendens (2)
Dicranum polysetum (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
379 m (360-427)

MEAN MOISTURE REGIME (RANGE):
Subxeric (subxeric-submesic)

SOIL pH ($CaCl_2$):

LFH or Organic	4.8
A Horizon or Organic	6.0
B Horizon or Organic	7.0
C Horizon or Organic	6.8

MEAN % SLOPE (RANGE): 0 (0-2)

MODAL ASPECT (RANGE): level

SOIL SUBGROUPS:
Dominant: Orthic Brunisols
Associated: Eluviated Dystric, Orthic Eutric and Eluviated Eutric Brunisols; Orthic Gray Luvisols

SOIL SERIES:
Dominant: Pine Ridge
Associated: Sandilands, Woodridge

MEAN SOIL DRAINAGE (RANGE):
Rapidly (rapidly-well)

MODAL LANDFORMS:
Sandy to coarse loamy fans or beach ridges

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
JP 13.8 m (11.7-16.6)

MAI (MEAN): 2.2 m3

NUMBER OF PLOTS: 7

SUCCESSIONAL RELATIONSHIPS:

These forests are successionally stable. Jack pine is expected to maintain its dominance for long periods due to dry conditions and probable frequent fires. Succession to spruce is slow or non-existent.

SIMILAR FOREST ECOSYSTEMS:

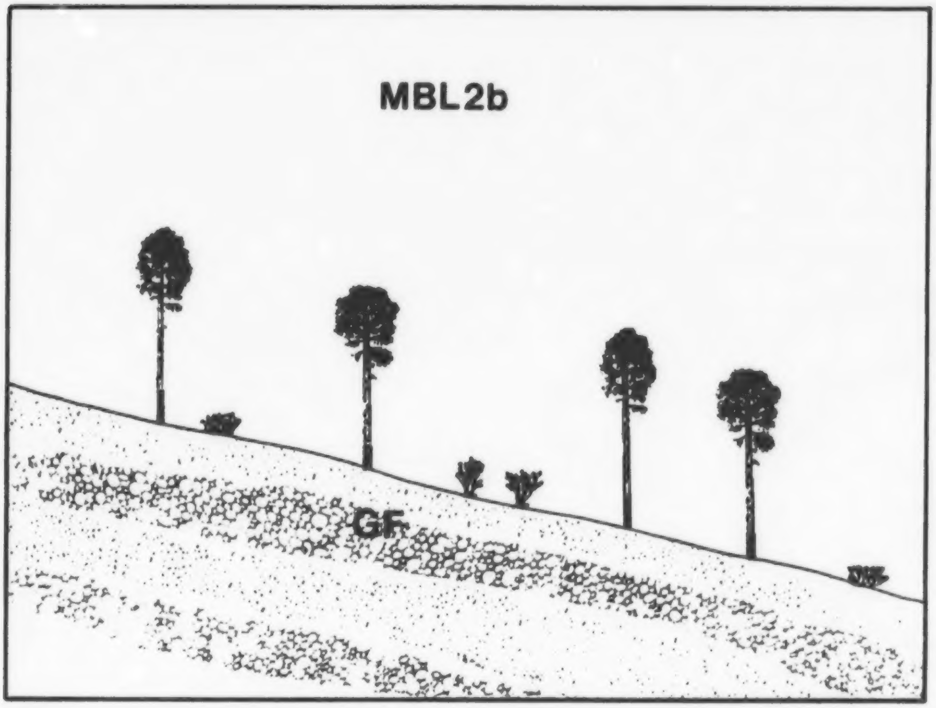
This ecosystem is wetter and richer than *JP/Hudsonia/Lichen* (MBL 1) and drier (better drained) than *JP/Pleurozium* (MBL 12), *JP/Ledum/Linnaea* (MBL 3), and *JP/Vaccinium* (MBL 4).

MBL 2b

TA/Amelanchier/Arctostaphylos - Wintergreen

(trembling aspen/saskatoon-berry/bearberry - Gleyed Eluviated Eutric Brunisol glaciofluvial fans)

SLOPE:	2%	ASPECT:	Variable
ELEVATION:	355-360 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
A	CC,SC	L	L	L	JP	C

MBL 2b

TA/Amelanchier/Arctostaphylos - Wintergreen

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Populus tremuloides (42)

Shrub Layer
- Amelanchier alnifolia (9)
- Vaccinium myrtilloides (8)
- Rosa spp. (7)
- Alnus crispa (5)
- Populus tremuloides (2)
- Spiraea alba (2)

Herb and Dwarf Shrub Layer
- Arctostaphylos uva-ursi (8)
- Aralia nudicaulis (4)
- Maianthemum canadense (3)
- Agropyron subsecundum (2)
- Elymus innovatus (1)
- Rubus pubescens (1)
- Cornus canadensis (+)
- Lathyrus ochroleucus (+)
- Aster ciliolatus (+)
- Heuchera richardsonii (+)
- Campanula rotundifolia (+)
- Solidago hispida (+)
- Galium boreale (+)

Moss and Lichen Layer
- Brachythecium populeum (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
359 m (355-363)

MEAN MOISTURE REGIME (RANGE):
Submesic (subxeric-subhygric)

SOIL pH (CaCl2):

LFH or Organic	-
A Horizon or Organic	5.5
B Horizon or Organic	7.0
C Horizon or Organic	-

MEAN % SLOPE (RANGE): 1 (0-2)

MODAL ASPECT (RANGE): Variable

SOIL SUBGROUPS:
Dominant: Gleyed Eluviated Eutric Brunisols
Associated: Orthic Brunisols

SOIL SERIES:
Dominant: Wintergreen
Associated: Pine Ridge

MEAN SOIL DRAINAGE (RANGE):
Well (rapidly-imperfectly)

MODAL LANDFORMS:
Gently undulating glaciofluvial fans (sandy-gravelly)

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
TA 18.1 m (12.5-22.5)

MAI (MEAN): 2.2 m3

NUMBER OF PLOTS: 3

SUCCESSIONAL RELATIONSHIPS:

This forest ecosystem is successionally relatively stable. Aspen will likely maintain its cover for some time. Succession to spruce may be hampered by frequent fires and dry surface soils.

SIMILAR FOREST ECOSYSTEMS:

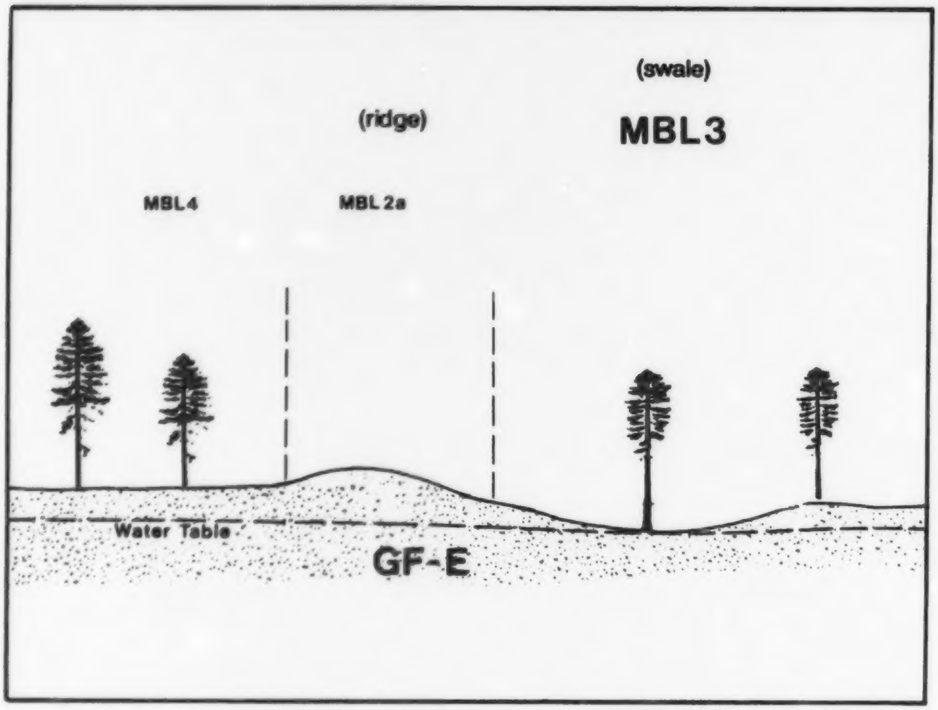
This ecosystem is most similar to *Populus/Corylus/Aralia* (MBL 5a) but is drier (at least in the upper soil horizons) and poorer. It has affinities to the *Populus-Rosa/Elymus* Ecosystem of Kabzems et al. (1986).

MBL 3

JP/Ledum/Linnaea - Kerry

(jack pine/labrador tea/twin-flower - Rego Gleysol/sandy beach swales)

SLOPE:	0-1%	ASPECT:	Level
ELEVATION:	351 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
A	CC,SC	L	L	M	JP	C

MBL 3

JP/Ledum/Linnaea - Kerry

CHARACTERISTIC SPECIES (mean % cover):

Shrub Layer
- Pinus banksiana (18)
- Potentilla fruticosa (13)
- Ledum groenlandicum (9)
- Betula glandulosa (8)
- Cornus alternifolia (5)
- Lonicera villosa (4)
- Picea mariana (3)
- Alnus crispa (2)
- Amelanchier alnifolia (+)
- Rosa spp. (+)
- Salix spp. (+)

Herb and Dwarf Shrub Layer
- Linnaea borealis (34)
- Fragaria virginiana (3)
- Carex scirpoides (3)
- Rubus pubescens (2)
- Aster ciliolatus (2)
- Galium boreale (1)
- Maianthemum canadense (1)
- Arctostaphylos uva-ursi (1)
- Solidago hispida (1)
- Deschampsia caespitosa (1)
- Botrychium virginianum (+)
- Equisetum scirpoides (+)
- Lilium philadelphicum (+)
- Petasites palmatus (+)

Moss and Lichen Layer
- Pleurozium schreberi (3)
- Cladina mitis (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 351 m

MEAN MOISTURE REGIME (RANGE):
Subhydric (hygric-subhydric)

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 0 (0-1)

MODAL ASPECT (RANGE): level

SOIL SUBGROUPS:

Dominant:	Orthic Gleysols
Associated:	Gleyed Eutric Brunisols

SOIL SERIES:

Dominant:	Kerry
Associated:	Wintergreen

MEAN SOIL DRAINAGE (RANGE):
Poorly

MODAL LANDFORMS:
Duned beach ridges (glaciofluvial or eolian)

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
JP 12.7 m (9.2-15.1)

MAI (MEAN): 0.2 m3

NUMBER OF PLOTS: 3

SUCCESSIONAL RELATIONSHIPS:

These forests are seral with black spruce the probable climax species.

SIMILAR FOREST ECOSYSTEMS:

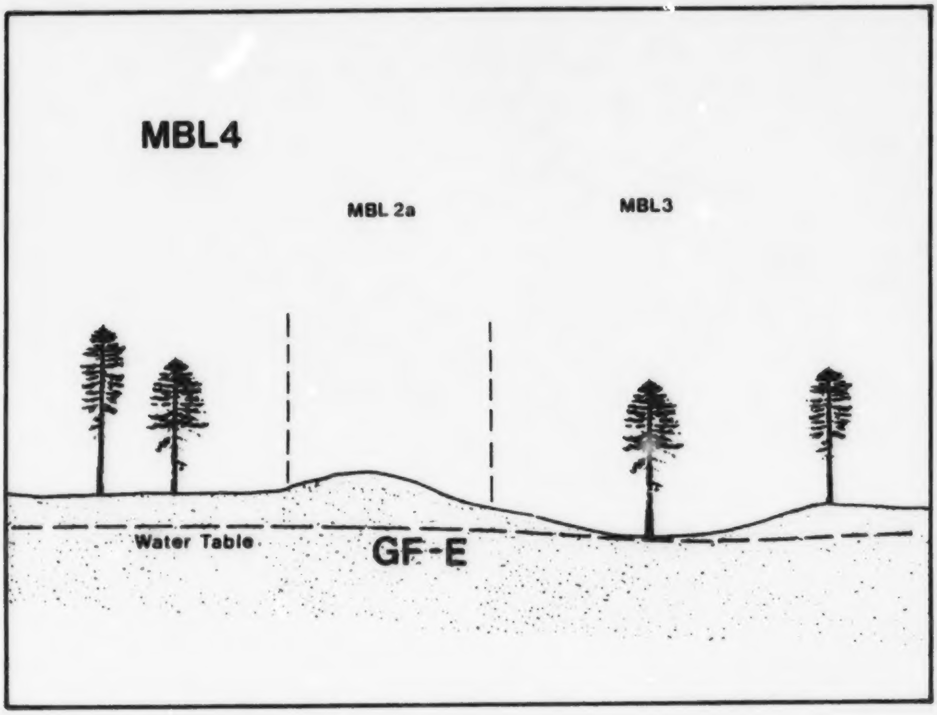
This ecosystem is similar to *JP/Vaccinium* (MBL 4) but usually more poorly drained.

MBL 4

JP/Vaccinium - Lonesand

(jack pine/blueberry - Gleyed Eluviated Dystric Brunisol/sand beach swales)

SLOPE:	0%	ASPECT:	Flat
ELEVATION:	350 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
A	CC,SC	L	L	M	JP	C

JP/Vaccinium - Lonesand

CHARACTERISTIC SPECIES (mean % cover):

Shrub Layer
- Pinus banksiana (20)
- Alnus crispa (10)
- Vaccinium myrtilloides (10)
- Picea mariana (3)
- Ledum groenlandicum (2)

Herb and Dwarf Shrub Layer
- Epilobium angustifolium (1)
- Equisetum sylvaticum (+)

Moss and Lichen Layer
- Cladonia gracilis (6)
- Polytrichum juniperinum (5)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 351 m

MEAN MOISTURE REGIME (RANGE):
Subhygric (submesic-hygric)

SOIL pH (CaCl2):

LFH or Organic	4.7
A Horizon or Organic	4.9
B Horizon or Organic	5.4
C Horizon or Organic	-

MEAN % SLOPE (RANGE): 0 (0-2)

MODAL ASPECT (RANGE):
Level (level-South)

SOIL SUBGROUPS:

Dominant:	Gleyed Eluviated Dystric Brunisols
Associated:	Gleyed Eluviated Eutric Brunisols

SOIL SERIES:

Dominant:	Lonesand
Associated:	Wintergreen

MEAN SOIL DRAINAGE (RANGE):
Poorly (imperfectly-poorly)

MODAL LANDFORMS:
Beach swales (glaciofluvial or eolian)

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
JP 15.8 m (14.1-17.3)

MAI (MEAN): 0.6 m3

NUMBER OF PLOTS: 4

SUCCESSIONAL RELATIONSHIPS:

In the study area this forest ecosystem was characterized by a high water table. Black spruce was common in the understory and barring any disturbance will be the dominant tree. On better drained sites spruce establishment will be difficult and jack pine will likely persist.

SIMILAR FOREST ECOSYSTEMS:

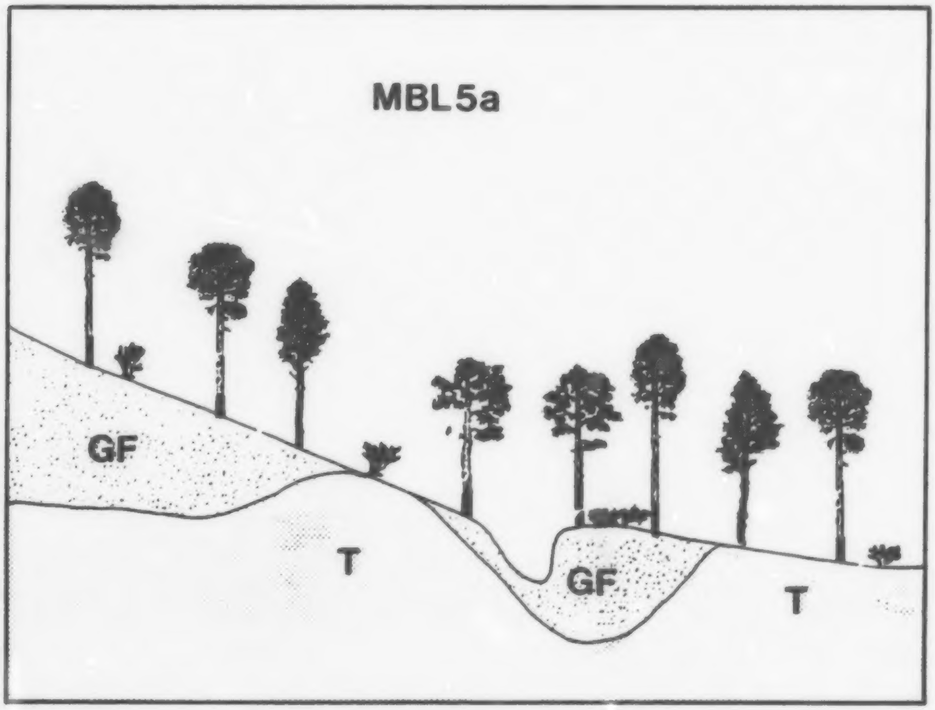
This ecosystem is most similar to *JP/Ledum/Linnaea* (MBL 3) but better drained.

MBL 5a

Populus/Corylus/Aralia - Pine Ridge/Waitville

(trembling aspen, balsam poplar/beaked hazelnut/wild sarsaparilla - Orthic Gray Luvisol/ Eluviated Eutric Brunisol/sandy glaciofluvial fans//Orthic Gray Luvisol/fine-loamy till)

SLOPE:	2-7%	ASPECT:	North-Northeast-Northwest
ELEVATION:	396-601 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
W	CC	M	H	M	WS(TA)	C,BR(N)

Populus/Corylus/Aralia - Pine Ridge/Waitville

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Populus tremuloides (18)
- Populus balsamifera (4)
- Betula papyrifera (3)

Shrub Layer
- Corylus cornuta (14)
- Acer spicatum (5)
- Rosa spp. (4)
- Cornus stolonifera (4)
- Prunus virginiana (3)
- Symphoricarpos albus (2)
- Amelanchier alnifolia (2)
- Populus tremuloides (1)
- Viburnum edule (1)
- Picea glauca (1)

Herb and Dwarf Shrub Layer
- Aralia nudicaulis (18)
- Rubus pubescens (10)
- Aster ciliolatus (3)
- Cornus canadensis (3)
- Mitella nuda (3)
- Linnaea borealis (2)
- Pyrola asarifolia (1)
- Maianthemum canadense (1)
- Petasites palmatus (1)
- Bromus ciliatus (1)
- Galium boreale (+)
- Viola renifolia (+)
- Lathyrus ochroleucus (+)
- Sanicula marilandica (+)
- Disporum trachycarpum (+)
- Mertensia paniculata (+)
- Galium triflorum (+)
- Pyrola secunda (+)
- Elymus innovatus (+)

Moss and Lichen Layer
- Brachythecium populeum (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
465 m (396-601)

MEAN MOISTURE REGIME (RANGE):
Mesic (submeisc-subhygric)

SOIL pH (CaCl2):

LFH or Organic	6.2
A Horizon or Organic	6.8
B Horizon or Organic	7.3
C Horizon or Organic	7.7

MEAN % SLOPE (RANGE): 4 (2-7)

MODAL ASPECT (RANGE):
North (North-South)

SOIL SUBGROUPS:

Dominant:	Orthic Gray Luvisols
Associated:	Orthic Eutric Brunisols Gleyed Gray Luvisols

SOIL SERIES:

Dominant:	Pine Ridge
Associated:	Waitville, Wintergreen

MEAN SOIL DRAINAGE (RANGE):
Moderately well (well-poorly)

MODAL LANDFORMS:
Sandy glaciofluvial fans and hummocky moraines

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):

TA	17.7 m (15.4-21.6)
BPO	13.8 m
JP	13.3 m

MAI (MEAN): 4.1 m3

NUMBER OF PLOTS: 6

SUCCESSIONAL RELATIONSHIPS:

This association has several facies that differ by the dominant tree species. Although a spruce facies was not found in the study area it is expected that these forests will succeed to white spruce and/or black spruce.

SIMILAR FOREST ECOSYSTEMS:

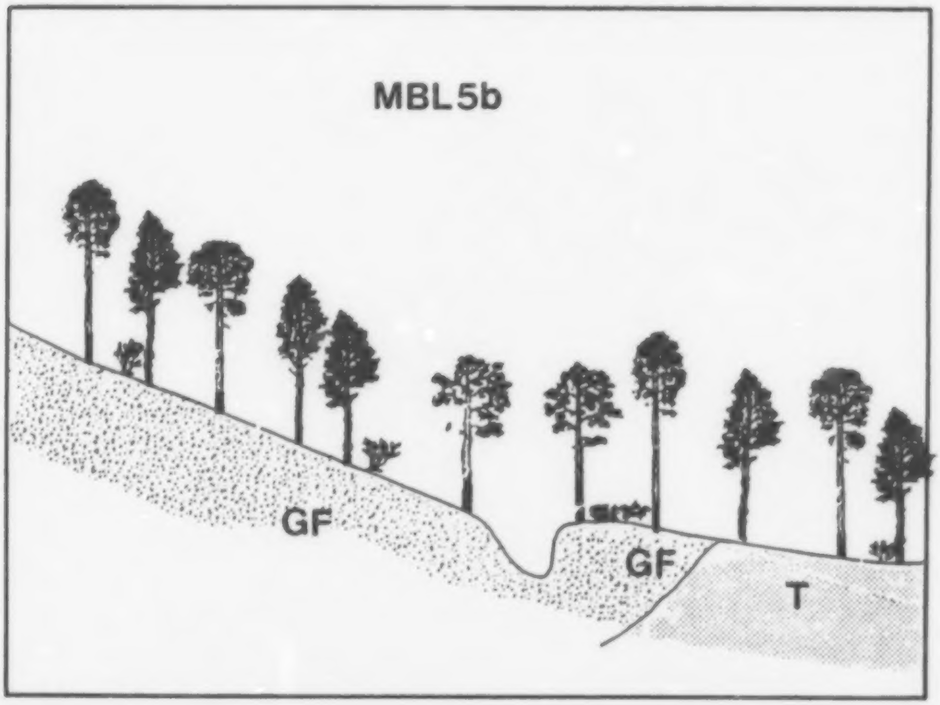
This ecosystem is most similar to *TA/Viburnum/Aralia* (BMW 5b) in the Boreal Mixedwood Ecoregion.

MBL 5b

WB/Corylus/Aralia - Pine Ridge/Waitville

(white birch, balsam poplar/beaked hazelnut/wild sarsaparilla - Orthic Gray Luvisol/ Eluviated Eutric Brunisol/sandy glaciofluvial fans//Orthic Gray Luvisol/fine-loamy till)

SLOPE:	2-7%	ASPECT:	North-Northeast-Northwest
ELEVATION:	396-601 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	CC	M	H	M	WS(TA)	C,BR(N)

MBL 5b

WB/Corylus/Aralia - Pine Ridge/Waitville

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Betula papyrifera (24)
- Pinus banksiana (1)

Shrub Layer
- Diervilla lonicera (13)
- Betula papyrifera (5)
- Corylus cornuta (4)
- Cornus stolonifera (4)
- Alnus crispa (3)
- Acer spicatum (2)
- Alnus rugosa (2)
- Viburnum edule (1)
- Rubus idaeus (1)
- Picea mariana (1)
- Rosa spp. (+)
- Populus tremuloides (+)
- Prunus virginiana (+)
- Vaccinium myrtilloides (+)
- Symphoricarpos albus (+)
- Viburnum trilobum (+)

Herb and Dwarf Shrub Layer
- Rubus pubescens (15)
- Aralia nudicaulis (7)
- Cornus canadensis (3)
- Linnaea borealis (3)
- Mitella nuda (2)
- Lycopodium annotinum (2)
- Aster ciliolatus (1)
- Trientalis borealis (+)
- Bromus ciliolatus (+)
- Elymus innovatus (+)
- Galium boreale (+)
- Maianthemum canadense (+)
- Galium triflorum (+)

Moss and Lichen Layer
- Brachythecium populeum (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
476 m (415-599)

MEAN MOISTURE REGIME (RANGE):
Subhygric (submesic-subhydric)

SOIL pH (CaCl2):
LFH or Organic -
A Horizon or Organic 4.5
B Horizon or Organic -
C Horizon or Organic -

MEAN % SLOPE (RANGE): 0 (0-2)

MODAL ASPECT (RANGE):
Level

SOIL SUBGROUPS:
Dominant: Orthic Gray Luvisols
Associated: Peaty Rego Humic Gleysols

SOIL SERIES:
Dominant: Pine Ridge, Waitville
Associated: Sundown

MEAN SOIL DRAINAGE (RANGE):
Imperfectly (well-very poorly)

MODAL LANDFORMS:
Sandy glaciofluvial fans and hummocky moraine

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
WB 18.8 m
TA 15.5 m

MAI (MEAN): 3.2 m3

NUMBER OF PLOTS: 3

SUCCESSIONAL RELATIONSHIPS:

This forest ecosystem is expected to succeed to white and/or black spruce.

SIMILAR FOREST ECOSYSTEMS:

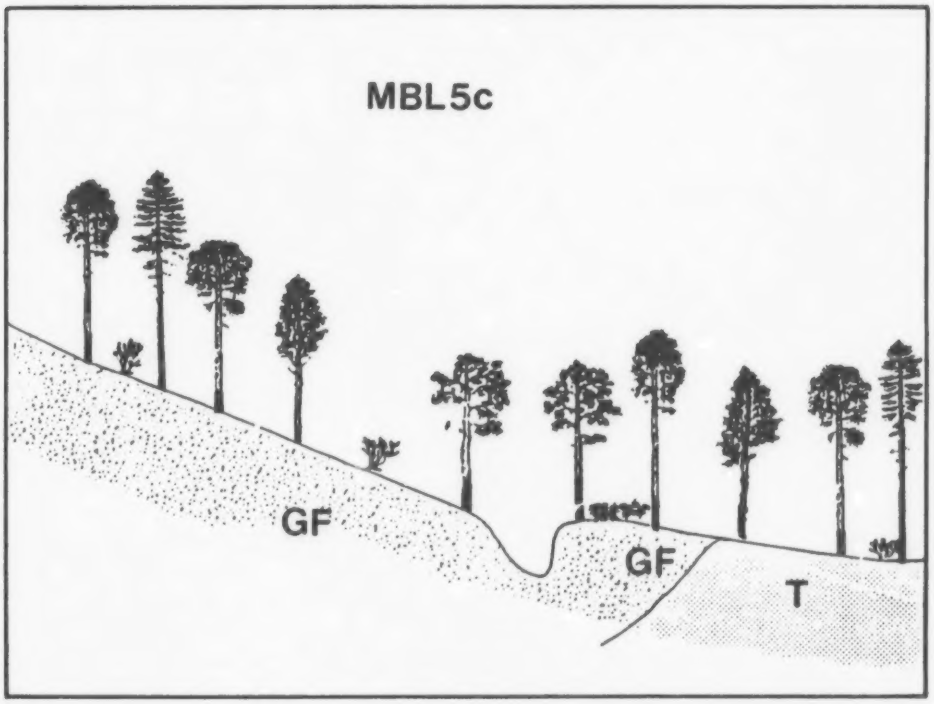
This ecosystem is most similar to *WB/ Viburnum/Aralia* (BMW 5d) in the Boreal Mixedwood Ecoregion.

MBL 5c

JP/Corylus/Aralia - Pine Ridge/Waitville

(jack pine, balsam poplar/beaked hazelnut/wild sarsaparilla - Orthic Gray Luvisol/
Eluviated Eutric Brunisol/sandy glaciofluvial fans//Orthic Gray Luvisol/fine-loamy till)

SLOPE:	2-7%	ASPECT:	North-Northeast-Northwest
ELEVATION:	396-601 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	CC	M	H	M	WS, JP	C,BR(N)

JP/Corylus/Aralia - Waitville

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Pinus banksiana (10)
- Betula papyrifera (8)

Shrub Layer
- Diervilla lonicera (50)
- Prunus virginiana (4)
- Rubus idaeus (4)
- Corylus cornuta (2)
- Cornus stolonifera (2)
- Viburnum edule (2)
- Amelanchier alnifolia (1)
- Picea glauca (1)
- Populus balsamifera (1)
- Rosa spp. (1)

Herb and Dwarf Shrub Layer
- Aralia nudicaulis (18)
- Rubus pubescens (5)
- Elymus innovatus (4)
- Fragaria virginiana (4)
- Cornus canadensis (3)
- Lathyrus ochroleucus (2)
- Epilobium angustifolium (1)
- Galium boreale (1)
- Linnaea borealis (1)
- Mertensia paniculata (1)
- Petasites palmatus (1)

Moss and Lichen Layer
- Pleurozium schreberi (1)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 599 m

MEAN MOISTURE REGIME (RANGE):
Mesic

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 10

MODAL ASPECT (RANGE):
Southwest

SOIL SUBGROUPS:

Dominant:	Orthic Gray Luvisols
Associated:	-

SOIL SERIES:

Dominant:	Waitville
Associated:	-

MEAN SOIL DRAINAGE (RANGE):
Well

MODAL LANDFORMS:
Sandy glaciofluvial fans and hummocky moraine

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
JP 13.1 m

MAI (MEAN): 3.5 m3

NUMBER OF PLOTS: 1

SUCCESSIONAL RELATIONSHIPS:

This forest ecosystem is expected to succeed to white and/or black spruce.

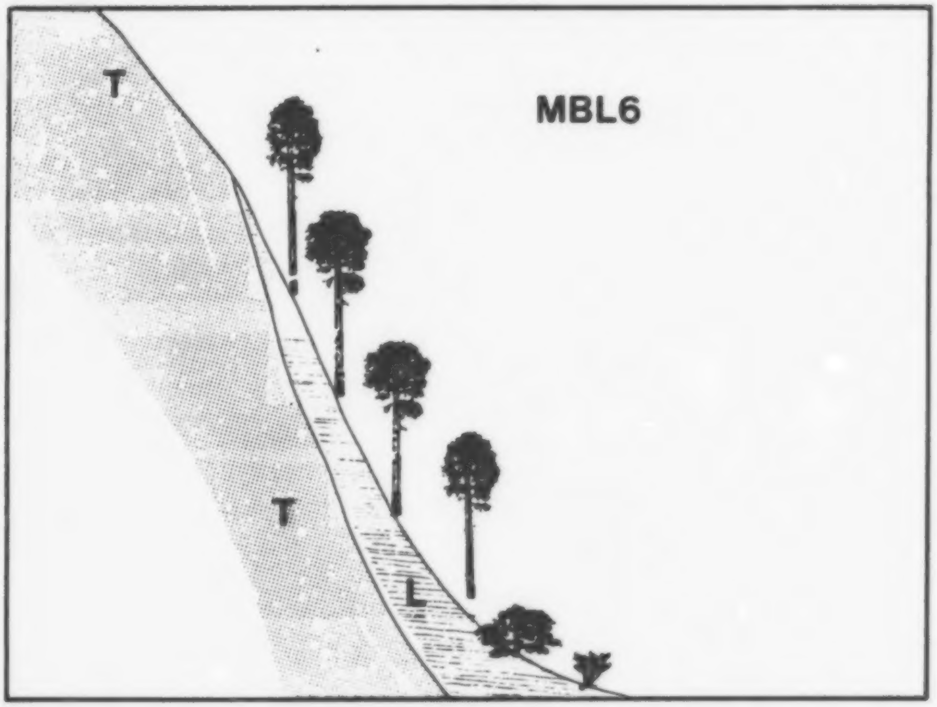
SIMILAR FOREST ECOSYSTEMS:

This ecosystem is most similar to *JP/Amelanchier/Arctostaphylos* (MBL 2a) but wetter and richer.

MBL 6

TA/Acer - Duck Mountain
(trembling aspen/mountain maple - Orthic Gray Luvisol/clay veneer over till)

SLOPE:	57%	ASPECT:	Northeast
ELEVATION:	530 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
W	CC	M	H	M	WS(TA)	C,BR(N)

TA/Acer - Duck Mountain

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
  Populus tremuloides (23)

Shrub Layer
  Acer spicatum (52)
  Corylus cornuta (14)
  Symphoricarpos albus (+)
  Viburnum edule (+)

Herb and Dwarf Shrub Layer
  Rubus pubescens (3)
  Aralia nudicaulis (2)
  Viola renifolia (2)
  Aster ciliolatus (+)
  Matteucia struthiopteris (+)
  Galium trifloum (+)
  Mertensia paniculata (+)
  Petasites palmatus (+)
  Pyrola asarifolia (+)
  Trientalis borealis (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
500 m (473-526)

MEAN MOISTURE REGIME (RANGE):
Mesic

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 31 (4-57)

MODAL ASPECT (RANGE):
North (North-Northeast)

SOIL SUBGROUPS:

Dominant:	Orthic Gray Luvisols
Associated:	-

SOIL SERIES:

Dominant:	Duck Mountain, Pine Ridge
Associated:	-

MEAN SOIL DRAINAGE (RANGE):
Well

MODAL LANDFORMS:
Stream channels - glaciolacustrine veneer over till

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
TA 19.0 m

MAI (MEAN): 3.7 m3

NUMBER OF PLOTS: 2

SUCCESSIONAL RELATIONSHIPS:

This association is characterized by a dense shrub layer. Tree seedlings may be suppressed for long periods. The presence of balsam fir in some stands suggests this species may be an important component of the tree layer in the future.

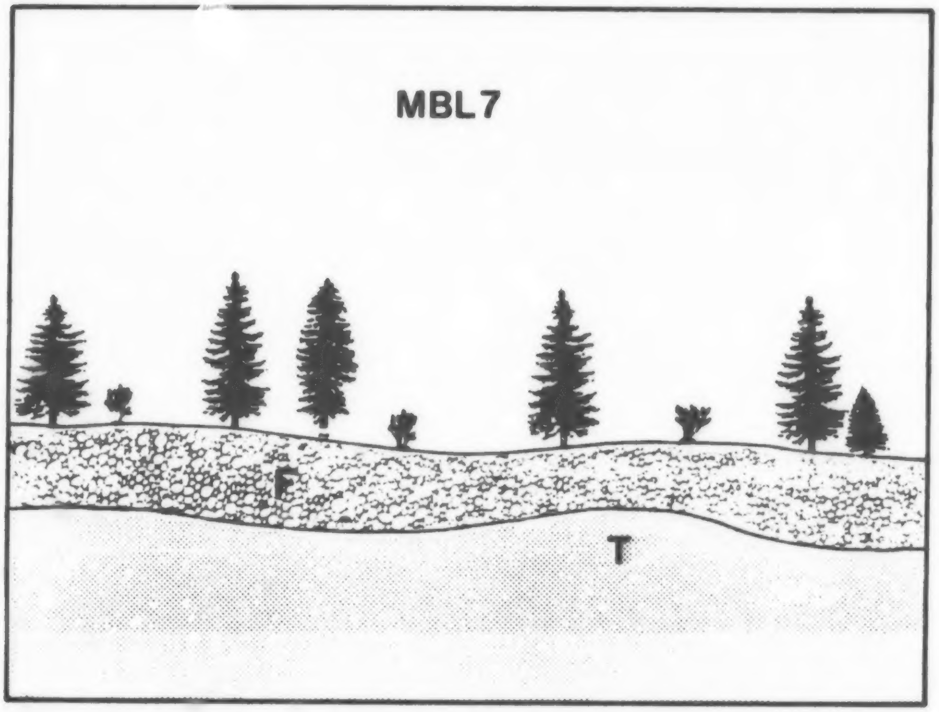
SIMILAR FOREST ECOSYSTEMS:

This ecosystem is most similar to *BPO/Acer/Matteucia* (MBL 8a) but better drained.

MBL 7

Picea/Cornus stolonifera - Novra
(spruce/red osier dogwood - Rego Gleysol/recent fluvial)

SLOPE: 1%
ELEVATION: 390 m
ASPECT: Variable
RELIEF: Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	CC,SC	H	H	H	WS	C,BR

MBL 7

Picea/Cornus stolonifera - Novra

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Picea mariana (7)
- Picea glauca (6)
- Populus tremuloides (5)
- Populus balsamifera (4)

Shrub Layer
- Picea mariana (13)
- Cornus stolonifera (10)
- Rosa spp. (3)
- Picea glauca (1)
- Salix spp. (1)
- Shepherdia canadensis (1)
- Viburnum edule (1)

Herb and Dwarf Shrub Layer
- Rubus pubescens (9)
- Aster ciliolatus (5)
- Fragaria virginiana (5)
- Vaccinium vitis-idaea (3)
- Aralia nudicaulis (2)
- Cornus canadensis (2)
- Linnaea borealis (2)
- Mertensia paniculata (2)
- Petasites palmatus (2)
- Calamagrostis canadensis (1)
- Maianthemum canadense (1)

Moss and Lichen Layer
- Hylocomium splendens (1)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 387 m

MEAN MOISTURE REGIME (RANGE):
Subhydric

SOIL pH (CaCl2):

LFH or Organic	7.2
A Horizon or Organic	-
B Horizon or Organic	7.8
C Horizon or Organic	8.5

MEAN % SLOPE (RANGE): 1

MODAL ASPECT (RANGE):
Level

SOIL SUBGROUPS:
Dominant: Orthic Gleysols
Associated: -

SOIL SERIES:
Dominant: Novra
Associated: -

MEAN SOIL DRAINAGE (RANGE):
Poorly

MODAL LANDFORMS:
Gently undulating fluvial blanket or veneer over till

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
WS 20.3 m

MAI (MEAN): 3.3 m3

NUMBER OF PLOTS: 1

SUCCESSIONAL RELATIONSHIPS:

This forest ecosystem is successionally mature.

SIMILAR FOREST ECOSYSTEMS:

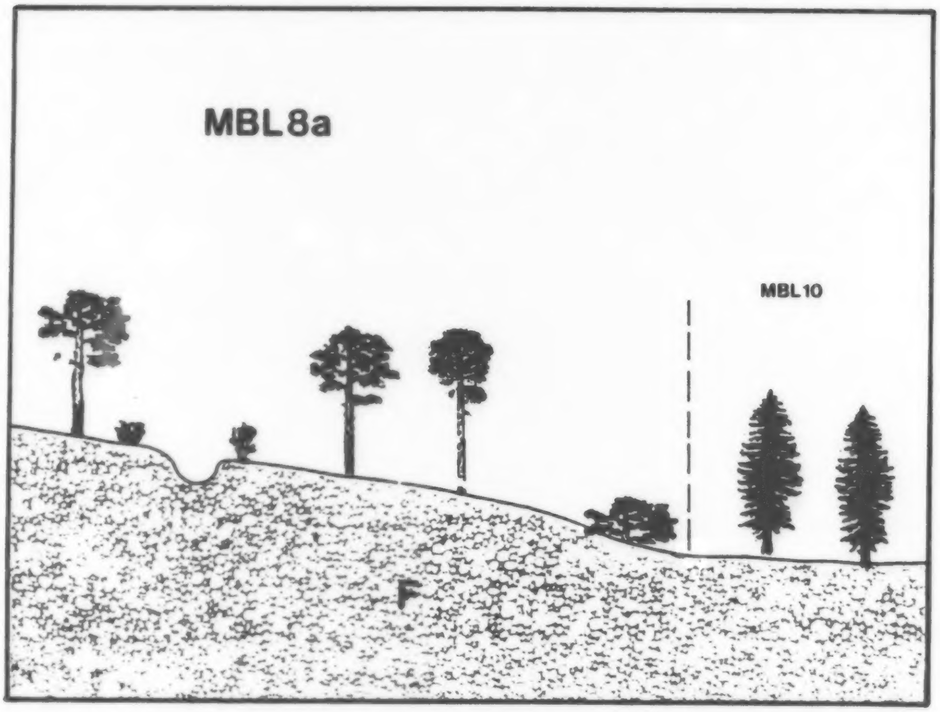
This ecosystem is very similar to *WS/ Hylocomium* (MBL 10). The two ecosystems differ mainly in amount of feather moss cover. More sample plots are needed to establish their relationship.

MBL 8a

BPO/Acer/Matteucia - Homestead

(balsam poplar/mountain maple/fern - Gleyed Cumulic Regosol/recent fluvial)

SLOPE:	3%	ASPECT:	Variable
ELEVATION:	473 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	CC,SC	H	H	H	WS	C,BR

MBL 8a

BPO/Acer/Matteucia - Homestead

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
  Populus balsamifera (17)

Shrub Layer
  Acer spicatum (68)
  Corylus cornuta (1)
  Ribes triste (1)
  Viburnum trilobum (+)

Herb and Dwarf Shrub Layer
  Matteucia struthiopteris (6)
  Carex spp. (6)
  Rubus pubescens (5)
  Aster ciliolatus (1)
  Mertensia paniculata (1)
  Maianthemum canadense (1)
  Viola renifolia (1)
  Galium triflorum (+)
  Galium boreale (+)
  Thalictrum venulosum (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
  492 m (473-511)

MEAN MOISTURE REGIME (RANGE):
  Hygric (subhygric-hygric)

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 4 (3-4)

MODAL ASPECT (RANGE): Variable

SOIL SUBGROUPS:
  Dominant: Cumulic Regosols
  Associated: Humic Luvic Gleysols

SOIL SERIES:
  Dominant: Homestead
  Associated: Breckon

MEAN SOIL DRAINAGE (RANGE):
  Imperfectly (well-poorly)

MODAL LANDFORMS:
  Undulating fluvial floodplains, terraces or fans

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
  BPO 19.6 m (17.8-21.4)
MAI (MEAN): 3.6 m3

NUMBER OF PLOTS: 2

SUCCESSIONAL RELATIONSHIPS:

This association is characterized by a dense shrub layer which may suppress young tree growth. Succession to white spruce is expected but may take a long period of time.

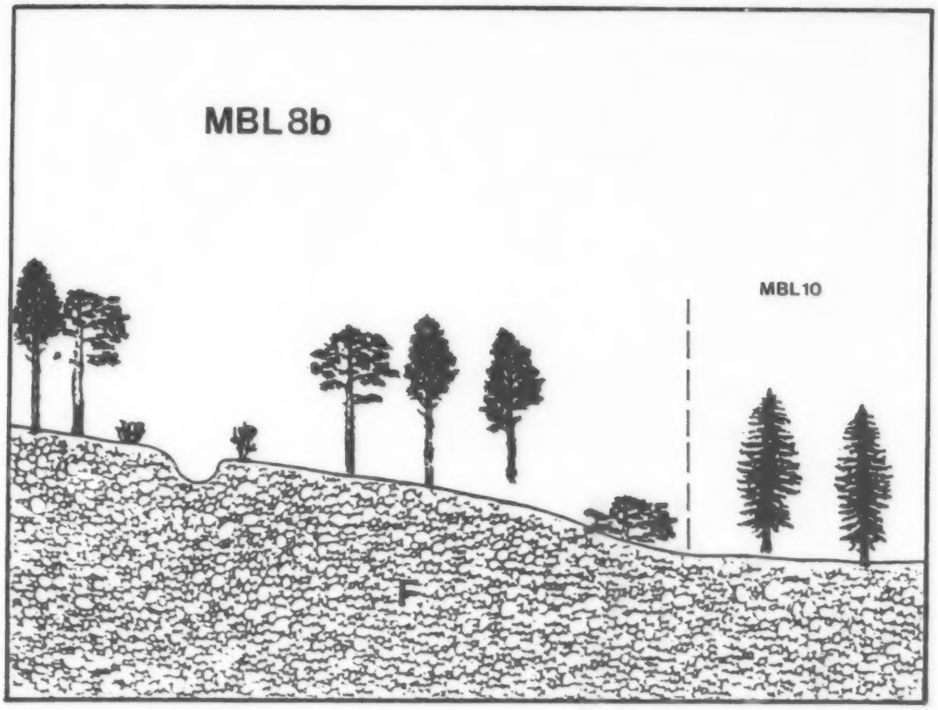
SIMILAR FOREST ECOSYSTEMS:

This ecosystem is most similar to *TA/Acer* (MBL 6) but less well drained.

MBL 8b

WB/Acer/Matteucia - Homestead
(white birch/mountain maple/fern - Gleyed Cumulic Regosol/recent fluvial)

SLOPE:	3%	ASPECT:	Variable
ELEVATION:	473 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
W	CC,SC	H	H	H	WS	C,BR

WB/Acer/Matteucia - Homestead

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Betula papyrifera (30)

Shrub Layer
- Acer spicatum (58)
- Corylus cornuta (2)
- Abies balsamea (+)

Herb and Dwarf Shrub Layer
- Viola renifolia (3)
- Matteucia struthiopteris (2)
- Aster ciliolatus (2)
- Rubus pubescens (2)
- Aralia nudicaulis (1)
- Cornus canadensis (+)
- Galium triflorum (+)
- Mertensia paniculata (+)
- Actea rubra (+)
- Anemone quinquefolia (+)
- Disporum trachycarpum (+)

Moss and Lichen Layer
- Brachythecium populeum (2)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
519 m (503-534)

MEAN MOISTURE REGIME (RANGE):
Mesic (submesic-subhygric)

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 27 (3-50)

MODAL ASPECT (RANGE): Variable

SOIL SUBGROUPS:

Dominant:	Gleyed and Cumulic Regosols
Associated:	-

SOIL SERIES:

Dominant:	Hometead
Associated:	Sinnott

MEAN SOIL DRAINAGE (RANGE):
Well (rapidly-moderately well)

MODAL LANDFORMS:
Undulating to hilly fluvial floodplains, terraces or fans

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
WB 16.8 m (16.5-17.1)

MAI (MEAN): 3.7 m3

NUMBER OF PLOTS: 2

SUCCESSIONAL RELATIONSHIPS:

This forest ecosystem has a dense shrub layer which may suppress young tree growth. Sucession to spruce and/or balsam fir is expected but may take a long time.

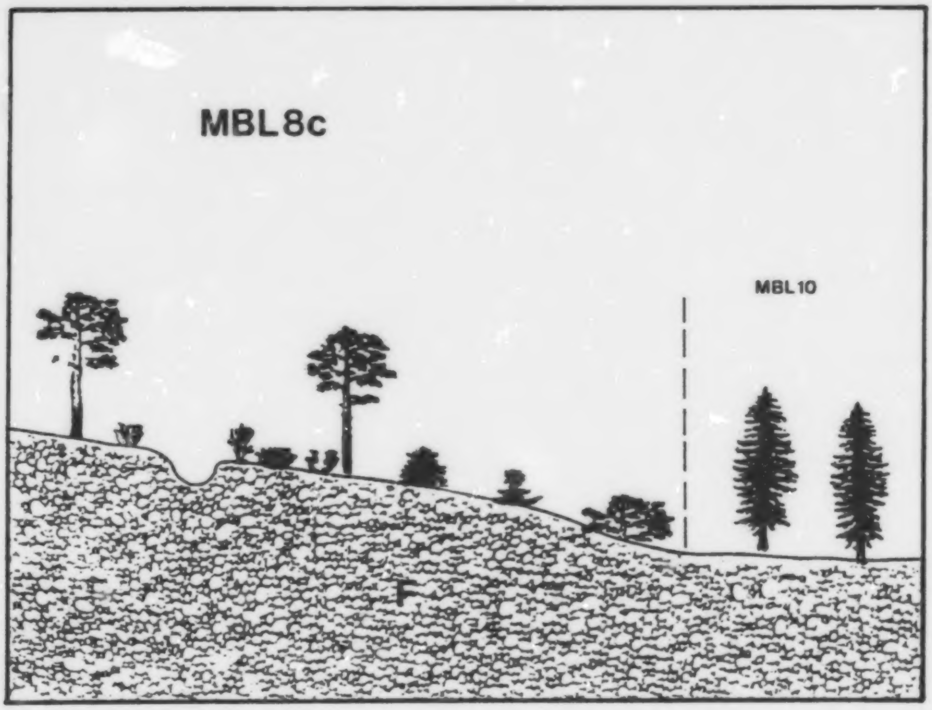
SIMILAR FOREST ECOSYSTEMS:

This ecosystem is most similar to *TA/Acer* (MBL 6) but less well drained.

MBL 8c

WE/Acer/Matteucia - Homestead
(white elm/mountain maple/fern - Gleyed Cumulic Regosol/recent fluvial)

SLOPE:	3%	ASPECT:	Variable
ELEVATION:	473 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	CC,SC	H	H	H	WS	C,BR

WE/Acer/Matteucia - Homestead

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Ulmus americana (15)
- Populus tremuloides (8)
- Acer negundo (3)
- Fraxinus pensylvanica (3)
- Populus balsamifera (3)

Shrub Layer
- Viburnum trilobum (15)
- Fraxinus pensylvanica (6)
- Corylus cornuta (5)
- Prunus virginiana (4)
- Cornus stolonifera (3)
- Acer negundo (2)
- Acer spicatum (2)
- Amelanchier alnifolia (1)
- Populus tremuloides (1)

Herb and Dwarf Shrub Layer
- Matteucia struthiopteris (12)
- Aster ciliolatus (5)
- Carex spp. (3)
- Rubus pubescens (3)
- Equisetum pratense (2)
- Aralia nudicaulis (1)
- Disporum trachycarpum (1)
- Fragaria virginiana (1)
- Maianthemum canadense (1)
- Thalictrum venulosum (1)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 404 m

MEAN MOISTURE REGIME (RANGE):
Subhygric

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 5

MODAL ASPECT (RANGE):
Northwest

SOIL SUBGROUPS:

Dominant:	Gleyed Cumulic Regosols
Associated:	-

SOIL SERIES:

Dominant:	Homestead
Associated:	Novra

MEAN SOIL DRAINAGE (RANGE):
Imperfectly

MODAL LANDFORMS:
Undulating fluvial floodplains, terraces or fans

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
Hardwood 15.2 m

MAI (MEAN): 1.3 m3

NUMBER OF PLOTS: 1

SUCCESSIONAL RELATIONSHIPS:

Succession to spruce is expected but may take a long time due to the dense shrub layer.

SIMILAR FOREST ECOSYSTEMS:

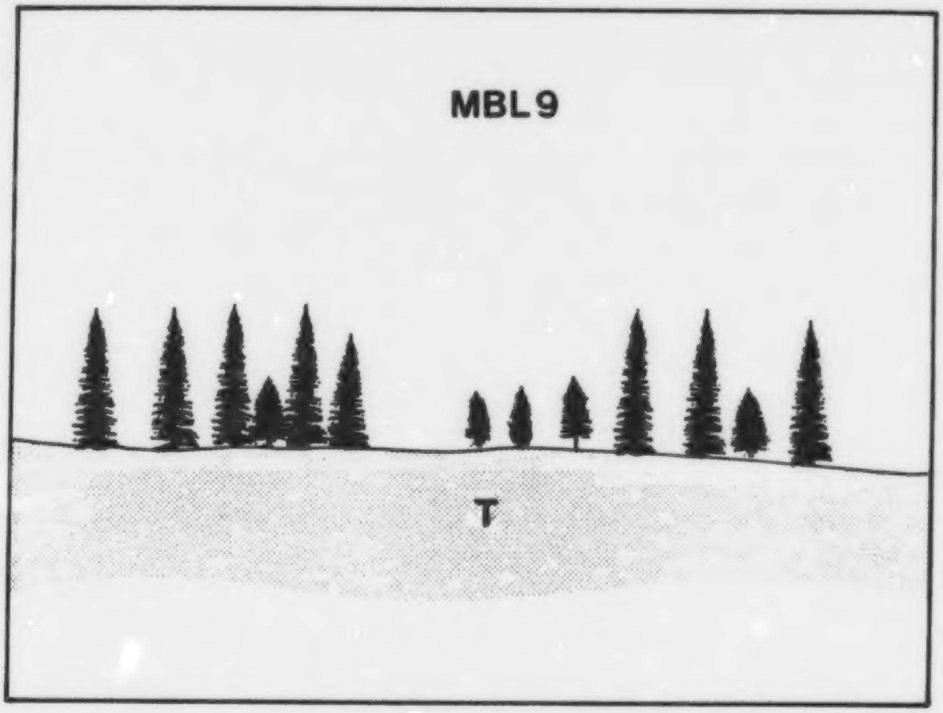
This ecosystem is most similar to *TA/Acer* (MBL 6) but less well drained.

MBL 9

BF - Waitville

(balsam fir - Orthic Gray Luvisol/fine loamy till)

SLOPE:	3%	ASPECT:	Variable
ELEVATION:	510-540 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	CC	M	H	M	WS	C.BR

BF - Waitville

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
  Abies balsamea (42)
  Betula papyrifera (5)

Shrub Layer
  Acer spicatum (2)
  Abies balsamea (+)

Herb and Dwarf Shrub Layer
  Mitella nuda (2)
  Aralia nudicaulis (1)
  Cornus canadensis (+)
  Trientalis borealis (+)
  Viola renifolia (+)

Moss and Lichen Layer
  Peltigera polydactyla (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
  526 m (511-541)

MEAN MOISTURE REGIME (RANGE):
  Mesic

SOIL pH (CaCl2):

LFH or Organic	6.2
A Horizon or Organic	5.4
B Horizon or Organic	-
C Horizon or Organic	8.0

MEAN % SLOPE (RANGE): 3

MODAL ASPECT (RANGE): Variable

SOIL SUBGROUPS:

Dominant:	Orthic Gray Luvisols
Associated:	-

SOIL SERIES:

Dominant:	Waitville
Associated:	-

MEAN SOIL DRAINAGE (RANGE):
  Well

MODAL LANDFORMS:
  Gently undulating morainal blanket (till)

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
  BF 16.0 m

MAI (MEAN): 5.3 m3

NUMBER OF PLOTS: 2

SUCCESSIONAL RELATIONSHIPS:

This association is successionally mature.

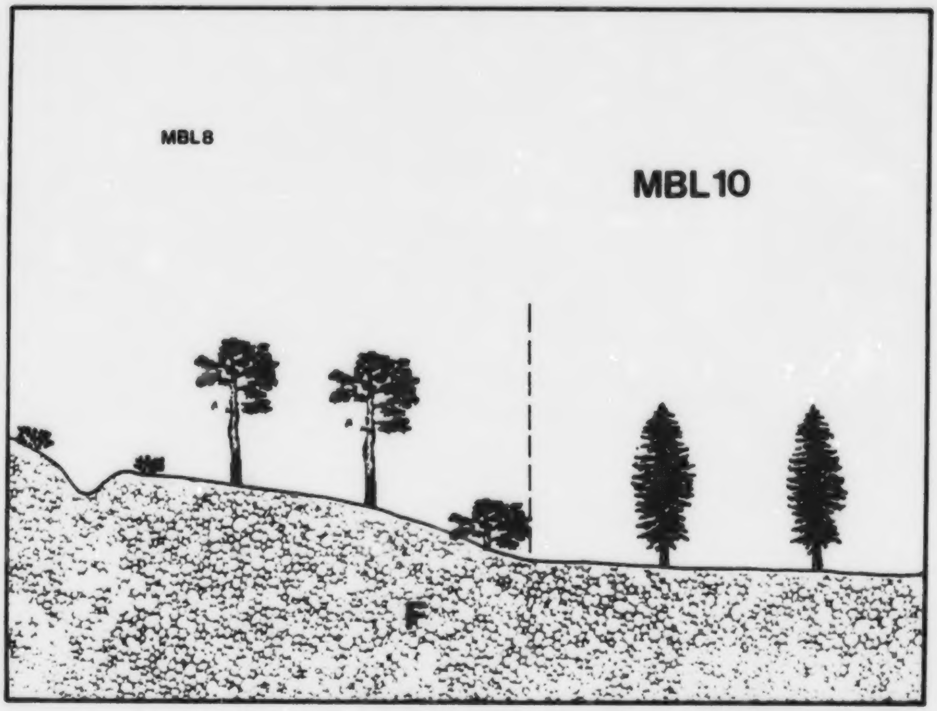
SIMILAR FOREST ECOSYSTEMS:

This ecosystem is most similar to *BF* (BMW 7) in the Boreal Mixedwood Ecoregion.

MBL 10

WS/Hylocomium - Novra
(white spruce/stairstep moss - Rego Gleysol/recent fluvial)

SLOPE:	0%	ASPECT:	Level
ELEVATION:	380 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting				Silviculture		
Season	Method	Compaction Hazard	Erosion Hazard	Site Prep.	Species	Method
W	CC,SC	H	H	H	WS	C,BR

WS/Hylocomium - Novra

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Picea glauca (13)
- Picea mariana (9)
- Populus balsamifera (2)

Shrub Layer
- Cornus stolonifera (3)
- Picea glauca (2)
- Picea mariana (1)
- Rosa spp. (1)

Herb and Dwarf Shrub Layer
- Rubus pubescens (12)
- Cornus canadensis (5)
- Linnaea borealis (4)
- Petasites palmatus (4)
- Carex vaginata (3)
- Fragaria virginiana (3)
- Aster ciliolatus (2)
- Smilacina stellata (1)

Moss and Lichen Layer
- Hylocomium splendens (40)
- Pleurozium schreberi (1)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 381 m

MEAN MOISTURE REGIME (RANGE):
Subhygric

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 0

MODAL ASPECT (RANGE): Level

SOIL SUBGROUPS:

Dominant:	Orthic Gleysols
Associated:	-

SOIL SERIES:

Dominant:	Novra
Associated:	-

MEAN SOIL DRAINAGE (RANGE):
Imperfectly

MODAL LANDFORMS:
Level fluvial fans

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
Softwood 15.2 m

MAI (MEAN): 3.3 m3

NUMBER OF PLOTS: 1

SUCCESSIONAL RELATIONSHIPS:

This forest ecosystem is successionally mature.

SIMILAR FOREST ECOSYSTEMS:

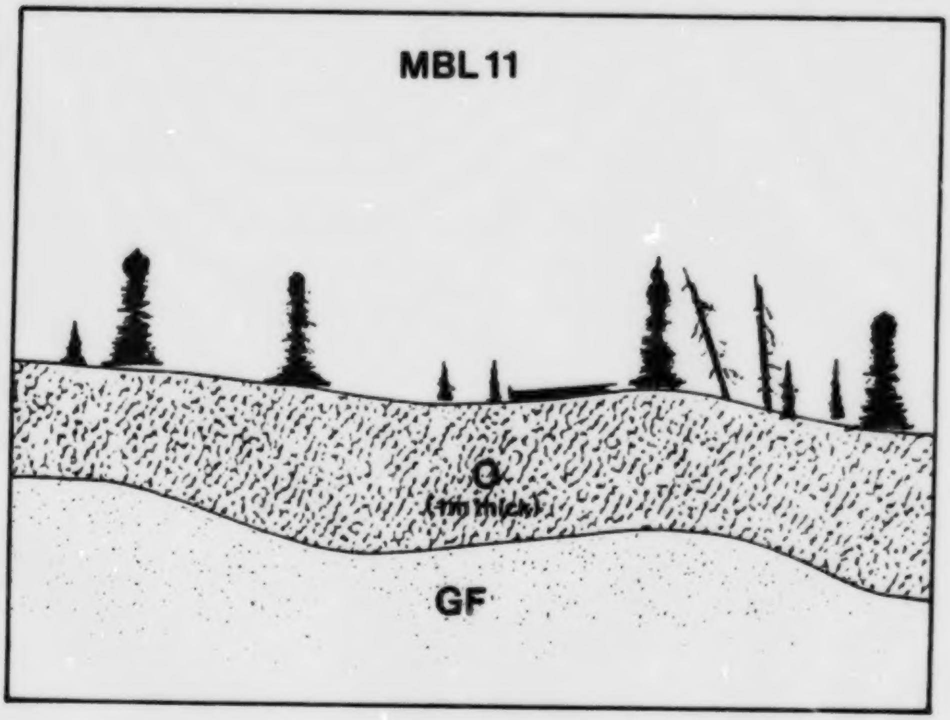
This ecosystem is similar to *WS/Hylocomium* (BMW 4) in the Boreal Mixedwood Ecoregion. It has affinities with wetter phases of the *Picea glauca-Pleurozium* Ecosystem of Kabzems et al. (1986).

MBL 11

BS/Ledum/Sphagnum - Kircro

(black spruce/labrador tea/peat moss - Terric Mesisol/mesic peat over sand)

SLOPE:	0%	ASPECT:	Level
ELEVATION:	350 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
-	L	peat	L	H	BS	C

BS/Ledum/Sphagnum - Kircro

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Larix laricina (2)

Shrub Layer
- Picea mariana (18)
- Ledum groenlandicum (16)
- Larix laricina (3)
- Betula glandulosa (+)
- Salix spp. (+)
- Alnus crispa (+)

Herb and Dwarf Shrub Layer
- Vaccinium vitis-idaea (4)
- Carex paupercula (2)
- Andromeda glaucophylla (1)
- Oxycoccus quadripetalus (1)
- Potentilla palustris (+)

Moss and Lichen Layer
- Sphagnum nemoreum (33)
- Pleurozium schreberi (23)
- Sphagnum magellanicum (21)
- Polytrichum strictum (1)
- Aulacomium palustre (+)
- Cladina rangiferina (+)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 351 m

MEAN MOISTURE REGIME (RANGE):
Hydric (subhydric-hydric)

SOIL pH (CaCl2): Not sampled

MEAN % SLOPE (RANGE): 0

MODAL ASPECT (RANGE): Level

SOIL SUBGROUPS:
Dominant: Terric and Typic Mesisols
Associated: Peaty Humic Gleysols

SOIL SERIES:
Dominant: Kicro
Associated: Kerry

MEAN SOIL DRAINAGE (RANGE):
Very poorly (poorly-very poorly)

MODAL LANDFORMS:
Organic blanket over beach sand

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
BS 6.0 m (5.2-6.8)

MAI (MEAN): 0.3 m3

NUMBER OF PLOTS: 3

SUCCESSIONAL RELATIONSHIPS:

This association is successionally mature.

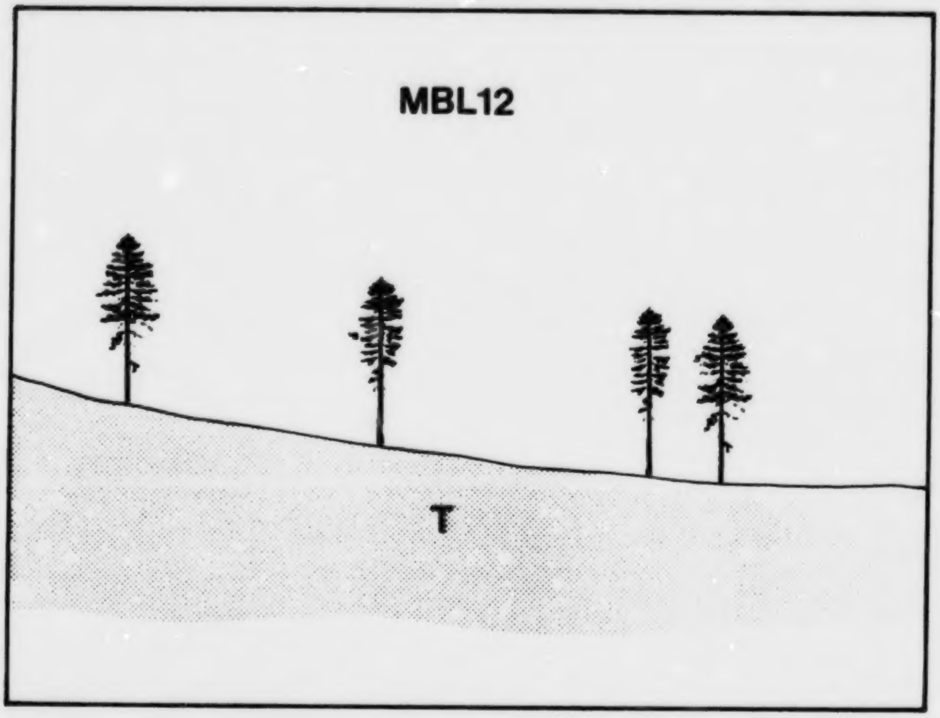
SIMILAR FOREST ECOSYSTEMS:

This ecosystem is similar to *BS/Ledum/Sphagnum* (BMW 9) in the Boreal Mixedwood Ecoregion. It corresponds to the *Picea mariana-Ledum/Sphagnum* Ecosystem of Kabzems et al. (1986).

MBL 12

JP/Pleurozium - Waitville
(jack pine/feather moss - Orthic Gray Luvisol/fine loamy till)

SLOPE:	2-3%	ASPECT:	Variable
ELEVATION:	600 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	CC	M	H	M	WS, JP	C(N)

MBL 12

JP/Pleurozium - Waitville

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
- Pinus banksiana (19)
- Picea mariana (1)

Shrub Layer
- Alnus crispa (11)
- Rosa spp. (4)
- Betula papyrifera (3)
- Viburnum edule (2)
- Picea mariana (2)
- Abies balsamea (2)
- Corylus cornuta (1)
- Diervilla lonicera (1)
- Populus tremuloides (+)

Herb and Dwarf Shrub Layer
- Rubus pubescens (13)
- Cornus canadensis (7)
- Aralia nudicaulis (6)
- Lycopodium annotinum (6)
- Elymus innovatus (6)
- Linnaea borealis (6)
- Fragaria virginiana (3)
- Aster ciliolatus (2)
- Petasites palmatus (1)
- Mertensia paniculata (1)
- Maianthemum canadense (+)
- Galium boreale (+)
- Mitella nuda (+)
- Pyrola secunda (+)
- Anemone quinquefolia (+)
- Epilobium angustifolium (+)
- Trientalis borealis (+)
- Galium triflorum (+)

Moss and Lichen Layer
- Pleurozium schreberi (66)
- Hylocomium splendens (15)
- Ptilium crista-castrensis (3)

ENVIRONMENT:

MEAN ELEVATION (RANGE):
521 m (367-598)

MEAN MOISTURE REGIME (RANGE):
Mesic

SOIL pH (CaCl2):
LFH or Organic -
A Horizon or Organic 6.0
B Horizon or Organic 7.3
C Horizon or Organic -

MEAN % SLOPE (RANGE): 3 (2-3)

MODAL ASPECT (RANGE): Variable

SOIL SUBGROUPS:
Dominant: Orthic Gray Luvisols
Associated: -

SOIL SERIES:
Dominant: Waitville
Associated: Caliento

MEAN SOIL DRAINAGE (RANGE):
Moderately well

MODAL LANDFORMS:
Undulating morainal

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
JP 15.1 m (13.4-16.4)

MAI (MEAN): 3.5 m3

NUMBER OF PLOTS: 3

SUCCESSIONAL RELATIONSHIPS:

Stands of this association will likely succeed to black spruce.

SIMILAR FOREST ECOSYSTEMS:

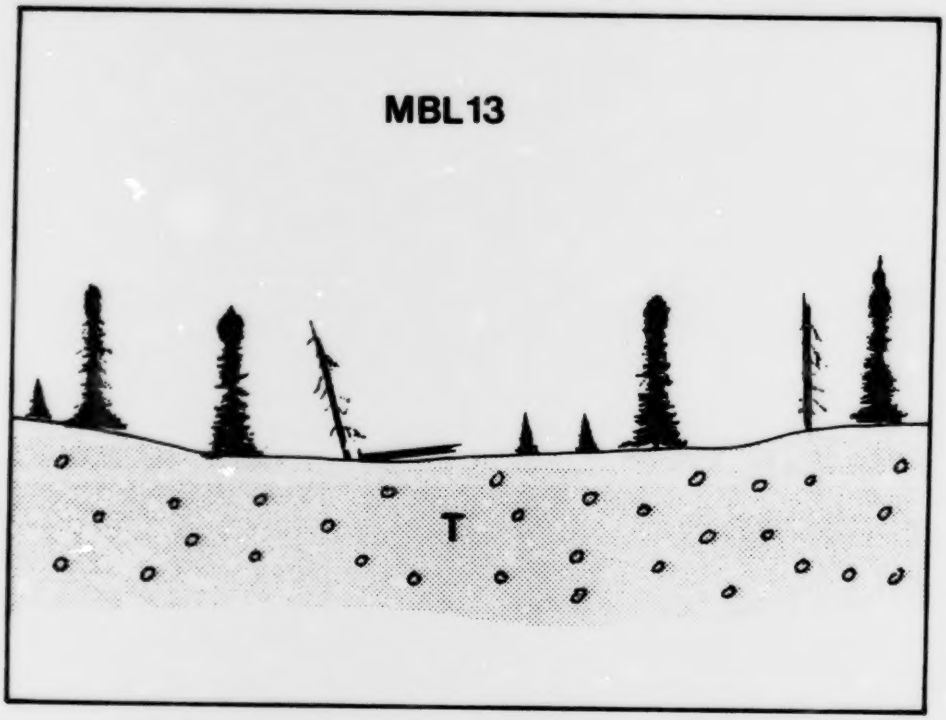
This ecosystem is most similar to *JP/Lycopodium/Pleurozium* (BMW 2) in the Boreal Mixedwood Ecoregion. It corresponds to the *Pinus-Pleurozium/Lycopodium* Ecosystem of Kabzems et al. (1986).

MBL 13

BS/Pleurozium - Hylocomium - Meleb

(black spruce/feather moss - stairstep moss - Rego Humic Gleysol/stony, loamy till)

SLOPE:	0%	ASPECT:	Level
ELEVATION:	370 m	RELIEF:	Low



MANAGEMENT RATINGS

Harvesting		Compaction Hazard	Erosion Hazard	Silviculture		
Season	Method			Site Prep.	Species	Method
W	CC	H	H	H	WS(BS)	C(N)

BS/Pleurozium - Hylocomium - Meleb

CHARACTERISTIC SPECIES (mean % cover):

Tree Layer
  Pinus banksiana (20)
  Picea mariana (12)

Shrub Layer
  Abies balsamea (1)
  Vaccinium myrtilloides (1)

Herb and Dwarf Shrub Layer
  Linnaea borealis (3)
  Petasites palmatus (2)
  Carex spp. (1)
  Maianthemum canadense (1)

Moss and Lichen Layer
  Hylocomium splendens (34)
  Pleurozium schreberi (33)
  Ptilium crista-castrensis (30)

ENVIRONMENT:

MEAN ELEVATION (RANGE): 367

MEAN MOISTURE REGIME (RANGE):
  Subhydric

SOIL pH (CaCl2):

LFH or Organic	4.8
A Horizon or Organic	-
B Horizon or Organic	7.0
C Horizon or Organic	8.4

MEAN % SLOPE (RANGE): 0

MODAL ASPECT (RANGE): Level

SOIL SUBGROUPS:

Dominant:	Orthic Gleysols
Associated:	-

SOIL SERIES:

Dominant:	Meleb
Associated:	-

MEAN SOIL DRAINAGE (RANGE):
  Poorly

MODAL LANDFORMS:
  Nearly level stony morainal blanket (till)

PRODUCTIVITY:

MEAN SI AT 50 (RANGE):
  JP 14.4 m

MAI (MEAN): 3.1 m3

NUMBER OF PLOTS: 1

SUCCESSIONAL RELATIONSHIPS:

This association is successionally mature. Stands with more jack pine will gradually succeed to black spruce.

SIMILAR FOREST ECOSYSTEMS:

This ecosystem is most similar to *BS/Pleurozium-Hylocomium* (BMW 3) in the Boreal Mixedwood Ecoregion. It has affinities with the *Pinus/Picea mariana-Pleurozium* Ecosystem of Kabzems et al. (1986).

6.0 FOREST MANAGEMENT AND PRODUCTIVITY

Ratings of the performance of Forest Ecosystems under various silvicultural and harvesting management systems (i.e. management interpretations), and of the productivity of natural systems are described in this Section.

6.1 MANAGEMENT INTERPRETATIONS

The ratings of performance under different management inputs are necessarily estimates - since documented responses are not available at this time. Guidelines for the estimates are presented in the following tables - to allow review and criticism of the approach and the selected class limits. This is a pilot project - response and feedback are required.

Table 7. Optimum season of harvest.

Internal drainage	Texture of B horizon[1]	Optimum season of harvest
Rapidly to moderately well	Sandy	All
Rapidly to moderately well	Textures finer than sandy	Winter only[2]
Imperfectly to very poorly	All	Winter only

[1] Texture symbols are as follows: L = loam(y) and S = sand(y)

[2] The main concern on well-drained, fine- to medium-textured soils is susceptibility to soil compaction rather than ability to support heavy equipment.

COMMENTS:

Optimum season of harvest is either winter, when soils are frozen, or all season. All sites should be avoided during spring melt and after heavy rains. Choice of season relates to soil wetness and texture of the B horizon which determine trafficability and compaction hazard.

For discussion: should the following also be considered?
- proximity to streams or lakes
- thickness of organic layer
- other factors

Table 8. Site preparation intensity.

Internal drainage	Vegetational competition	Slash abundance	Organic layer thickness (cm)[1]	Intensity[2]
Rapidly to moderately well	Low	L-M	< 10	L
			10 - 15	M
			15 - 30	H
		H	> 30	H
	Moderate	L-M	< 15	M
		H	15 - 30	H
			> 30	H
Imperfectly to very poorly	L-M	L-M	< 15	M
			15 - 30	H
	High	L-H	< 30	H
		L-H	> 30	H

[1] Where the organic layer is >30 cm, seedlings should be planted in moist, unvegetated organic matter on the side of the prepared trench.

[2] L = low, M = moderate, and H = high.

COMMENTS:

Site preparation intensity indicates the degree of surface scarification required, which depends on vegetation competition hazard, seed supply and reforestation method. Several options are usually available.

For discussion: should we also consider:
- machine factors (slope, stoniness, trafficability)
- soil texture (stickiness, water holding capacity
- erosion hazard

The following discussion from Corns and Annas (1986) describes preparation intensity and equipment.

Low Intensity

These sites are generally moderately well to rapidly drained and have shallow (less than 10 cm) soil organic layers, minimal plant competition problems, and low to moderate slash abundance. Satisfactory lodgepole pine regeneration on many sites having a good cone supply may be achieved with minimal site preparation if the slash and cones are well distributed. Methods of low intensity site preparation include the following:

Screefing (mattock, boot, spade): These manual scarification methods may be appropriat when planting bare-root stock on topographically irregular sites, sites that are inaccessible to large machinery, sites where soil compaction may be a problem, small areas where it is expensive to move large machinery, and sites where plant competition (especially reedgrass (Calamagrostis canadensis) is well established and when more-severe site preparation may further stimulate competition.

Table 8. Site preparation intensity (cont'd)

Anchor-chain drags: This method gives satisfactory results on a wide variety of pine sites, and scarification intensity and degree of coverage can be regulated by the number and length of the drags. Caution should be taken to minimize soil compaction on sites with fine soil texture or weak structure.

Toothed scarifier blade: The main concern should be to redistribute slash (cones) if necessary, as the shallow organic layer should not pose a significant impediment to rooting seedlings. Soil compaction may be significant on fine-textured soils or on those with weak structure.

Moderate Intensity

These sites are moderately well to imperfectly drained, have moderately deep (10-15 cm) soil organic layers, moderate to high plant competition ratings, and low to moderate slash abundance. Methods of moderate intensity site preparation include the following:

Shark-fin barrels: This equipment does a satisfactory job on level to gently sloping moist sites with moderate slash abundance and moderately deep organic layers. Degree of scarification can be regulated by the amount of fluid put in the drums as well as the number and length of the attached anchor-chain drags.

Toothed scarifier blade: This equipment on a large tractor (e.g., Caterpillar D6 and larger) is capable of spreading large amounts of slash and penetrating deep organic layers.

Bracke scarifier: This machine may provide good results on mesic sites and sites where plant competition is a problem. It leaves planting sites with a wide range of moisture regimes from the top of the overturned soil and organic layer to the bottom of the scalp.

High Intensity

These sites are poorly to imperfectly drained, with deep (15-30 cm) organic horizons, generally high plant competition rating, and low to high slash abundance. Methods of severe intensity site preparation include the following:

Marttini plow: This rear-mounted plow is capable of exposing mineral soil on wet sites with deep organic layers. Compared with alternative equipment such as the C & S ripper plow, the Marttini plow's large size and weight make it more difficult to maneuver and increase the chances of getting stuck, resulting in soil damage. Chances of subsoil glazing and compaction are greater with the Marttini plow than with some other severe methods (e.g. ripper plow), although toothed edges on the plow will reduce glazing. Flooding of the furrow is a problem on very wet sites. Furrows should run perpendicular to slope contours to maximize soil drainage, but erosion can be a concern, particularly during spring runoff and on fine-textured till and lacustrine materials. The Marttini is best suited to very gentle short slopes on less erodible materials (e.g., some tills).

Ripper plow (Craig-Simpson, C & S): This plow and adaptations of it have proved to be versatile machines for site preparation on wet sites, because it is more maneuverable than the large Marttini. The ripper plow is often used in conjunction with a brush rake or toothed scarifier blade to move heavy slash, particularly the currently unutilitized hardwoods, into windrows.

Brush rake: This multitoothed bulldozer lade can effectively increase the receptive area for regeneration by putting heavy slash and unutilized hardwoods into windrows and by removing excess organic matter from the soil surface. As with other treatments that involve use of heavy equipment, soil compaction is likely to result.

Toothed scarifier blade: This blade can penetrate thick organic layers and spread heavy slash loads.

Cazes and Heppner plow (C & H): This wide, front-mounted V-blade can effectively remove virtually all vegetational competition (including well-established young trees) plus soil organic and surface mineral horizons. The resulting denuded surface can be very susceptible to erosion on slopes, especially where soils are fine-textured. Soil compaction and glazing of the subsoil could also be anticipated on fine-textured soils. The C & H plow is not advised for use on fine-textured soils or soils with excess water. The debris piled on both sides of the plow prevents lateral water moement at the soil surface and can cause flooding on the prepared seedbed. The edges of the bladed strips are usually the best sites for planting. In these situations, organic matter and nutrients are likely to be more abundant and susceptibility to drought and frost heave is likely to be less. Less-severe scarification methods are probably adequate preparation for planting on most sites, and the C H plwo should be restricted to areas of well-drained, medium- to coare-textured, stable soils hwere stand conversion (e.g. aspen to lodgepole pine) is being attempted.

Table 9. Soil compaction hazard (adapted from Boyer 1979).

Texture[1]	Coarse fragments	L & F (humus) thickness	Structure	Character of coarse fragments	Rating[2]
loamy, fine loamy	<35%	<5 cm	Strong	All	M
			Moderate and weak	All	M
coarse loamy		>5 cm	Moderate and weak	All	H
			Strong	All	M
	30-60%	<5 cm	Moderate and weak	Rounded	M
				Angular	M
			Strong	All	L
	>60%	Any	All	All	L
sandy	Any	Any	All	All	L
	>35%	Any	All	All	L
clayey	<35%	<5 cm	Strong	All	L
			Moderate and weak	All	M
		>5 cm	Moderate and weak	All	M
			Strong	All	L

[1] Texture symbols are as follows: L = loam(y), Si = silt(y), C = clay, S = sand(y), and vf = very fine.

[2] L = low, M = moderate, and H = high. In making a rating, consider the characteristics of the litter and upper 30 cm of mineral horizon(s). A wet or moist condition is assumed. The horizon that gives the poorest rating is used.

COMMENTS:

Soil compaction can result in poor root growth and seedling establishment. This is most important at landings and other high traffic areas. This information can be used to help choose landing sites.

Table 10. Soil water erosion hazard.

Parent material	Texture B horizon[1]	Slope (%)	Hazard[2]
Till	loamy to sandy	< 10	L
Till	fine loamy	< 10	M
Till	loamy to sandy	10 - 15	M
Till	Very stony variable texture	16 - 60	M
Eolian	sandy	0 +	M[3]
Glaciolacustrine	clayey	0 +	H
Glaciofluvial, fluvial	loamy to sandy	0 + (especially Gleysols)	H
Till	clayey to fine loamy	> 10	H
Till	loamy to sandy	> 15	H

[1] Textural groups are as follows: fine-sandy clay, silty clay, heavy clay; moderately fine-clay loam, sandy clay loam, silty clay loam; medium-very fine sandy loam, loam, silty loam, silt; moderately coarse-sandy loams; coarse-sands, loamy sand.

[2] L = low, M = moderate, H = high. Ratings assume unvegetated surface. Dense vegetation cover will reduce hazard by at least one class.

[3] Duned eolian (wind-deposited) sands have high wind erosion hazard if surface cover is removed.

COMMENTS:

Water erosion hazard has been of limited concern in Manitoba forest operations. Potential is greater in high relief areas like the Duck Mountains than in most areas, especially where clays are present on fairly steep slopes.

Table 11. Reforestation method on cut blocks.

		Reforestation options			
Site conditions	Seed availability[1]	Jack pine	White spruce	Black spruce	Aspen
Soil moderately well to rapidly drained, organic layer generally < 10 cm, vegetation competition not usually a problem	Abundant	Natural	Natural	Natural	Natural, root suckers
	Sparse	Container, direct seed[2]	Container, direct seed	Container, direct seed	Natural, root suckers
Soil imperfectly or more poorly drained, organic layer generally > 10 cm, vegetation competition often a problem	Abundant	Container, bare-root, natural	Container, bare-root, natural	Container, natural	N/A[3]
	Sparse	Bare-root, container	Bare-root, container	Container	N/A

[1] Seed abundance is a function of slash and cone abundance plus proximity to adjacent seed-producing trees (especially important for spruce).

[2] Direct seeding will have best results when 40-60% mineral soil is exposed and soil is near field capacity.

[3] N/A = Not applicable. Aspen does not do well under these conditions.

COMMENTS:

The following discussion of reforestation methods is from Corns and Annas (1986).

Reforestation method here refers to the means by which satisfactory tree stocking is achieved on logged areas. The alternatives are natural seeding from slash or adjacent trees, root suckers (aspen), manual or direct seeding, container planting stock, and bare-root planting stock. The situations applicable to the various options are discussed below:

Natural

Pine: Sites with good cone crops, soils moderately to well or better drained, and organic layers less than 10 cm thick can generally be adequately restocked without additional planting. A light scarification is usually necessary to bring cones into contact with mineral soil.

Spruce: Satisfactory natural spruce stocking is likely to be attained only on sites with a continuing seed source, such as on small patch or strip cuts or where seed trees are left, and will be favored where mineral soil is exposed and moisture is neither limited nor in excess.

Aspen: Satisfactory natural aspen stocking is usually achieved by root suckering from cut trees adjacent to uncut trees, without additional silvicultural input.

Balsam and subalpine fir: These generally regenerate satisfactorily naturally under the canopy of other trees as well as in the open, particularly at higher elevations.

Table 11. Reforestation method on cut blocks (cont'd)

Direct Seeding

Satisfactory stocking results from direct seeding can be expected only where there is a large amount of exposed mineral soil (40-60%). minimal vegetational competition. and enough moisture to ensure germination and seedling establishment. Timing of the seeding operation is crucial. It should be done on spring snow cover after a light snowfall (Hellum 1974). Success of direct seeding operations has been variable and generally not encouraging.

Planting Containerized Stock

In general, seedling survival and early growth is influenced by the volume available for root growth and development. Consequently, a seedling grown in a unit such as a Spencer-Lemaire 55 cm3 container should generally outperform those in the standard 40 cm3 container. particularly on sites with potential vegetation competition or snowshoe hare damage problems. It appears that on droughty sites containerized stock may be more desirable than the larger, more water-demanding bare-root stock.

Bare-root Stock

Bare-root planting stock can generally gain an advantage over container stock. especially on sites with abundant vegetational ompetition because of its greater size. age. and more sturdy condition. This is more true with white spruce than with pine. due to the slow initial growth of the spruce.

6.2 SITE/PRODUCTIVITY RELATIONSHIPS

6.2.1 OVERALL RESULTS

Basic statistics for the productivity variables used in this study are shown in Table 12 while Table 13 summarizes the significances of the F statistics determined in correlation analysis for the continuous variables and for ANOVA for the discrete variables.

A point should be made about significant levels. These levels correspond to the probabilities of obtaining F statistics at least as large as the ones calculated when there are no linear relationship between continuous variables or when population means are equal for discrete variables. Therefore large F statistics result in small significance values and rejection of the null hypotheses (Norusis 1986). In other words, small values lead to the conclusion that continuous variables are linearly related or that the means for discrete variable classes are not equal.

The most important point to note in Table 13 is that nearly all the variables are significantly related to softwood SI and MAI but only two variables are significantly related to hardwood SI. In addition, these same two variables are the only ones not significant in the case of softwood SI. Therefore, it appears that subdividing the 100 plots into two SI groups has created some difficulty.

Table 12. Summary Statistics on SI and MAI

	Softwood SI*	Hardwood SI*	MAI**
Plots	72	28	100
Mean	14.12	17.00	2.20
Standard Deviation	3.64	2.74	1.68
Minimum Value	4.80	11.00	0.01
Maximum Value	23.74	22.90	8.69

* SI - height in metres at 50 years

** MAI - volume (m^3) per hectare per year

Table 13. Significance of F Statistic for SI and MAI

		Softwood SI	Hardwood SI	MAI
a)	Continuous variables			
	Slope	.001**	.703	.219
	Silt-clay	.000**	.792	.000**
b)	Discrete variables			
	Aspect	.065	.012*	.011*
	Macro Slope Position	.007**	.317	.015*
	Meso Slope Position	.013*	.181	.001**
	Moisture Regime	.000**	.121	.000**
	Nutrient Regime	.004**	.926	.000**
	Plant Association	.000**	.291	.000**
	Soil Series	.000**	.356	.000**
	Ecoregion	.197	.027*	.001**
	Organic	.000**	-	.000**

* Significant at 0.05
** Significant at 0.01

6.2.2 CLASS MEANS FOR DISCRETE VARIABLES

Aspect

For hardwood SI, the mean SI for south facing exposures (class eight) was significantly different than that for plots that were either level or faced east or west. In addition the group two mean differed significantly from the mean of group six. For MAI, groups one and two differed from group four. Finally no range test was applied to softwood SI as the overall level of significance was only 0.065. Table 14 summarizes all the class means for the aspect variable.

Macro and Meso Slope Position

Tables 15 and 16 give the class means by macro and meso slope position. In both cases, slope positions are not related to hardwood SI (see Table 13) but they are significantly related to softwood SI and MAI.

For macro position, both the mean softwood SI and MAI for plots at upper or mid slope positions are significantly different than those off slope (group seven).

For meso position, the mean softwood SI and mean MAI for plots at mid slope are different than for plots in level positions. In addition, the mean MAI for upper slope positions is also significantly different from level plots.

Table 14. Mean Productivity Values by Aspect.

Aspect	Softwood SI	 (N)	Hardwood SI	 (N)	MAI	(N)
1 North (Min)	16.53	(10)	17.80	(2)	3.90 a	(12)
2	15.48	(2)	19.27 *	(4)	4.47 a	(6)
3	15.16	(9)	16.90	(3)	3.30 ab	(12)
4 E.W. level	12.73	(35)	15.74 *	(12)	2.32 b	(47)
5	13.82	(4)	-		3.34 ab	(4)
6	16.14	(2)	20.34 *	(2)	3.33 ab	(4)
7	15.68	(8)	18.02	(4)	3.45 ab	(12)
8 South (Max)	12.72	(2)	11.00 *	(1)	2.99 ab	(3)
All	14.12	(72)	17.00	(28)	3.00	(100)

Note: Means with the same letter denote no significant difference between the means based on the Student-Newman-Keuls test with an alpha value of 0.05. For Hardwood SI, group two is different than group six and group four is different than group eight.

Table 15. Mean Productivity Values by Macro Slope Position.

Macro Slope Position	Softwood SI	 (N)	Hardwood SI	 (N)	MAI	(N)
1 Apex	12.93 ab	(1)	-		0.30 ab	(1)
2 Face	17.39 ab	(1)	-		4.00 ab	(1)
3 Upper slope	15.16 a	(13)	16.36	(10)	3.54 a	(23)
4 Mid slope	16.28 a	(17)	16.24	(5)	3.57 a	(22)
5 Lower slope	15.32 ab	(6)	19.56	(3)	3.18 ab	(9)
6 Valley floor	12.36 ab	(5)	18.70	(3)	3.21 ab	(8)
7 Plain	12.38 b	(29)	16.63	(7)	2.26 b	(36)
All	14.12	(72)	17.00	(28)	3.00	(100)

Note: Means with the same letter denote no significant difference between the means based on the Student-Newman-Keuls test with an alpha value of 0.05.

Table 16. Mean Productivity Values by Meso Slope Position.

Macro Slope Position	Softwood SI	Softwood (N)	Hardwood SI	Hardwood (N)	MAI	(N)
1 Crest	12.93 ab	(1)	-		0.30 ab	(1)
2 Upper slope	14.52 ab	(10)	16.51	(12)	3.32 a	(22)
3 Mid slope	15.74 a	(23)	16.10	(8)	3.65 a	(31)
4 Lower slope	15.84 ab	(6)	19.48	(4)	3.40 ab	(10)
5 Toe	-		-		-	
6 Depression	-		-		-	
7 Level	12.55 b	(32)	17.81	(4)	2.20 b	(36)
All	14.12	(72)	17.00	(28)		

Note: Means with the same letter denote no significant difference between the means based on the Student-Newman-Keuls test with an alpha value of 0.05.

Moisture Regime

The means in Table 17 reveal that the relationships between softwood SI and MAI and moisture regime is nonlinear: productivity is generally lower at either end of the classification. Although this same trend might be expected for hardwood SI, it is not evident in this study.

For softwood SI, the two wettest classes (eight, nine) differ from most of the others. Specifically, the mean for group nine is significantly different from the means for groups three to seven inclusive and group eight is different from groups three to six inclusive.

In the case of MAI the more extreme groups, specifically classes two, three and eight are significantly different from the mid range groups, four to six inclusive.

Nutrient Regime

In Table 18 similar nonlinear trends appear to be present for softwood SI and MAI. For softwood SI, the mean for group one is different than the means for groups two, three and four. Perhaps surprisingly, the mean for group five is also different than those for groups two and three. It may be that moisture or vegetative competition is excessive on the plots labelled as eutrophic.

For MAI the same basic differences occur. Group one is different than groups two to four and also group five. Finally the mean for group two is significantly different than the mean for group three.

Table 17. Mean Productivity Values by Ecological Moisture Regime.

Moisture	Softwood SI	(N)	Hardwood SI	(N)	MAI	(N)
1 Very xeric	-	-	-	-	-	-
2 Xeric	12.28 *	(2)	-	-	0.17 a	(2)
3 Subxeric	13.71 *	(8)	15.99	(2)	1.71 a	(10)
4 Submesic	15.71 *	(4)	17.52	(5)	3.84 b	(9)
5 Mesic	15.51 *	(33)	16.16	(14)	3.69 b	(47)
6 Subhygric	17.60 *	(6)	17.90	(6)	3.48 b	(12)
7 Hygric	13.44 *	(4)	22.90	(1)	2.17 ab	(5)
8 Subhydric	10.35 *	(13)	-	-	1.55 a	(13)
9 Hydric	6.94 *	(2)	-	-	0.92 ab	(2)
All	14.12	(72)	17.00	(28)	3.00	(100)

* Significant differences for softwood SI are discussed in the text.

Note: Means with the same letter denote no significant difference between the means based on the Student-Newman-Keuls test with an alpha value of 0.05.

Table 18. Mean Productivity Values by Ecological Nutrient Regime.

Nutrient Regime	Softwood SI	(N)	Hardwood SI	(N)	MAI	(N)
1 Oligotrophic	10.13 *	(7)	-	-	0.80 *	(7)
2 Submesotrophic	14.87 *	(18)	16.89	(8)	2.66 *	(26)
3 Mesotrophic	15.24 *	(21)	16.86	(12)	3.78 *	(33)
4 Permesotrophic	15.28 *	(13)	17.33	(8)	3.21 *	(21)
5 Eutrophic	12.33 *	(12)	-	-	2.46 *	(12)
6 Hypereutrophic	11.60 *	(1)	-	-	3.52	(1)
All	14.12	(72)	17.00		3.00	(100)

* Significant differences for softwood SI and MAI are described in the text.

Note: Means with the same letter denote no significant differences between the means based on the Student-Newman-Keuls test with an alpha value of 0.05.

Plant Association and Soil Series

Mean productivity values are given for the 25 possible soil series in Table 19. Classes with significantly different means are shown in Table 20 for softwood SI and Table 21 for MAI.

In similar fashion, the means by plant association are shown in Table 22 while significant differences are indicated in Table 23 for softwood SI and Table 24 for MAI.

Ecoregion and Organic Soil Indicator

Table 25 summarizes the means for the two ecoregions and Table 26 summarizes the results when plots are evaluated relative to the presence or absence of organic soils.

Table 19. Mean Productivity Values by Soil Series.

	Softwood		Hardwood			
Soil Series	SI	(N)	SI	(N)	MAI	(N)
1 BCS	16.45	(2)	14.69	(1)	3.81	(3)
2 BKO	15.20	(1)	20.54	(2)	3.45	(3)
3 BYH	9.46	(2)	-		2.11	(2)
4 CIO	15.50	(1)	-		4.01	(1)
5 DKM	15.61	(4)	17.21	(4)	2.97	(8)
6 HMD	-		18.24	(2)	4.46	(2)
7 KIC	6.15	(2)	-		0.21	(2)
8 KRY	9.24	(3)	-		0.24	(3)
9 KTS	11.40	(2)	-		0.05	(2)
10 LSD	15.83	(3)	-		0.36	(3)
11 MEB	14.10	(1)	-		3.09	(1)
12 NOV	17.72	(2)	15.20	(1)	2.63	(3)
13 OOKX	9.02	(3)	-		1.16	(3)
14 PRG	13.92	(4)	16.84	(6)	3.16	(10)
15 RKH	16.74	(2)	-		5.53	(2)
16 SDI	13.22	(3)	-		1.90	(3)
17 SGU	13.36	(3)	-		4.07	(3)
18 SNT	8.85	(2)	17.99	(1)	2.12	(3)
19 SUWP	11.60	(1)	-		3.52	(1)
20 TEK	17.99	(1)	-		4.27	(1)
21 VRL	16.27	(4)	-		4.18	(4)
22 WGE	15.31	(2)	18.93	(3)	2.05	(5)
23 WKWX	8.10	(1)	-		1.72	(1)
24 WOG	14.28	(2)	-		3.65	(2)
25 WTV	16.02	(21)	15.49	(8)	3.78	(29)
All	14.12	(72)	17.00	(28)	3.00	(100)

Table 20. Significant Differences for Softwood SI by Soil Series.

```
                        G G G G G G G G G G G G G G G G G G G G G G G G
                        r r r r r r r r r r r r r r r r r r r r r r r r
                        p p p p p p p p p p p p p p p p p p p p p p p p
                          2 1 1       1 1 1 1 1 2   2     1 2 2   1 1 2
    Mean    Group       7 3 8 3 8 3 9 9 6 7 4 1 4 2 2 4 5 0 5 1 1 5 2 0

    6.1500  Gr[illegible]
    8.1000  G[illegible]3
    8.8500  Grp18
    9.0167  Grp13
    9.2400  Grp 8
    9.4550  Grp 3
   11.4000  Grp 9
   11.6000  Grp19
   13.2200  Grp16
   13.3600  Grp17
   13.9200  Grp14       *
   14.1000  Grp11
   14.2750  Grp24
   15.2000  Grp 2
   15.3150  Grp22
   15.5000  Grp 4
   15.6075  Grp 5       *
   15.8300  Grp10       *
   16.0200  Grp25       *   * * *
   16.2700  Grp21       *     *
   16.4500  Grp 1       *
   16.7450  Grp15       *
   17.7250  Grp12       *
   17.9900  Grp20

* Denotes pairs of groups significantly different at the .050 level
```

Table 21. Significant Differences for MAI by Soil Series.

```
                    G G G G G G G G G G G G G G G G G G G G G G G G G
                    r r r r r r r r r r r r r r r r r r r r r r r r r
                    p p p p p p p p p p p p p p p p p p p p p p p p p
                          1 1 2 1 2   1 1   1 1   1 2 2     1 2 2   1
Mean      Group     9 7 8 0 3 3 6 2 3 8 2 5 1 4 2 9 4 5 1 4 7 1 0 6 5

 .0499    Grp 9
 .2125    Grp 7
 .2435    Grp 8
 .3608    Grp10
1.1616    Grp13
1.7211    Grp23
1.9032    Grp16
2.0470    Grp22
2.1132    Grp 3
2.1206    Grp18
2.6296    Grp12
2.9749    Grp 5
3.0859    Grp11
3.1554    Grp14         *
3.4469    Grp 2
3.5163    Grp19
3.6475    Grp24
3.7798    Grp25     * * * *
3.8117    Grp 1
4.0096    Grp 4
4.0664    Grp17
4.1829    Grp21         * *
4.2714    Grp20
4.4574    Grp 6
5.5289    Grp15     * * * *

* Denotes pairs of groups significantly different at the .050 level
```

Table 22. Mean Productivity Values by Plant Association

	Softwood		Hardwood			
Plant Association	SI	(N)	SI	(N)	MAI	(N)
BOREAL MIXEDWOOD						
1 TA/Corylus/Aralia	23.74	(1)	11.00	(1)	1.50	(2)
2 JP/Lycopodium/Pleurozium	15.53	(7)	-		4.29	(7)
3 BS/Pleur-Hyloc.	13.00	(3)	-		3.64	(3)
4 WS/Hylocomium	16.58	(4)	-		4.23	(4)
5 WS/Viburnum/Aralia	17.39	(8)	-		4.36	(8)
6 Aw/Viburnum/Aralia	15.46	(2)	16.93	(4)	2.37	(6)
7 BPO/Viburnum/Aralia	-		15.29	(1)	3.13	(1)
8 WB/Viburnum/Aralia	14.73	(4)	15.25	(4)	3.77	(8)
9 BS/Viburnum/Aralia	13.54	(4)	-		4.05	(4)
10 WS/Equisetum	17.49	(1)	-		6.47	(1)
11 BF	12.10	(1)	-		5.32	(1)
12 BS/Ledum/Pleur.	9.11	(6)	-		1.70	(6)
13 BS/Ledum/Sphagnum	7.80	(1)	-		0.77	(1)
MID-BOREAL LOWLANDS						
14 JP/Hudsonia/Cladina	11.91	(3)	-		0.13	(3)
15 JP/Amelanchier/Arctostaphylos	13.78	(7)	-		2.15	(7)
16 Aw/Amelanchier/Arctostaphylos	-		18.16	(3)	2.25	(3)
17 JP/Ledum/Linnaea	12.67	(3)	-		0.16	(3)
18 JP/Vaccinium	15.76	(4)	-		0.60	(4)
19 Populus/Corylus/Aralia	15.20	(1)	16.97	(5)	4.07	(6)
20 WB/Corylus/Aralia	11.60	(1)	17.43	(2)	3.20	(3)
21 JP/Corylus/Aralia	14.30	(1)	-		3.52	(1)
22 TA/Acer	-		19.00	(2)	3.69	(2)
23 Picea/Cornus stolonifera	20.25	(1)	-		3.30	(1)
24 BPO/Acer/Matteucia	-		20.70	(2)	3.56	(2)
25 WB/Acer/Matteucia	-		17.99	(2)	3.72	(2)
26 Ulmus/Acer/Matteucia	-		15.20	(1)	1.33	(1)
27 BF	16.30	(1)	16.30	(1)	5.34	(2)
28 WS/Hylocomium	15.20	(1)	-		3.27	(1)
29 BS/Ledum/Sphagnum	5.70	(3)	-		0.28	(3)
30 JP/Pleurozium	15.57	(3)	-		3.51	(3)
31 BS/Pleur.-Hylo.	14.10	(1)	-		3.09	(1)
All	14.12	(72)	17.00	(28)	3.00	(100)

Table 23. Significant Differences for Softwood SI by Plant Association.

Mean	Group	Grp29	Grp13	Grp12	Grp20	Grp14	Grp11	Grp17	Grp3	Grp9	Grp15	Grp31	Grp21	Grp8	Grp19	Grp28	Grp6	Grp2	Grp30	Grp18	Grp27	Grp4	Grp5	Grp10	Grp23	Grp1
5.7000	Grp29																									
7.8000	Grp13																									
9.1100	Grp12																									
11.6000	Grp20																									
11.9100	Grp14	*																								
12.1000	Grp11																									
12.6733	Grp17	*																								
13.0000	Grp 3	*																								
13.5375	Grp 9	*		*																						
13.7757	Grp15	*		*																						
14.1000	Grp31	*																								
14.3000	Grp21	*																								
14.7325	Grp 8	*		*																						
15.2000	Grp19	*																								
15.2000	Grp28	*																								
15.4550	Grp 6	*		*																						
15.5271	Grp 2	*		*																						
15.5667	Grp30	*		*																						
15.7550	Grp18	*		*																						
16.3000	Grp27	*																								
16.5800	Grp 4	*		*																						
17.3863	Grp 5	*	*	*		*																				
17.4900	Grp10	*																								
20.2500	Grp23	*	*	*																						
23.7400	Grp 1	*	*	*	*	*	*	*	*	*	*			*				*	*	*		*	*			

* Denotes pairs of groups significantly different at the .050 level

Table 24. Significant Differences in MAI by Plant Association.

Mean	Group	Grp14	Grp17	Grp29	Grp18	Grp13	Grp26	Grp 1	Grp12	Grp15	Grp16	Grp 6	Grp31	Grp 7	Grp20	Grp28	Grp23	Grp30	Grp21	Grp24	Grp 3	Grp22	Grp25	Grp 8	Grp 9	Grp19	Grp 4	Grp 2	Grp 5	Grp11	Grp27	Grp10
.1346	Grp14																															
.1571	Grp17																															
.2810	Grp29																															
.6034	Grp18																															
.7663	Grp13																															
1.3254	Grp26																															
1.5022	Grp 1																															
1.7021	Grp12																															
2.1520	Grp15																															
2.2474	Grp16																															
2.3653	Grp 6																															
3.0859	Grp31																															
3.1296	Grp 7																															
3.1974	Grp20	*	*	*	*																											
3.2682	Grp28																															
3.2953	Grp23																															
3.5109	Grp30	*	*	*	*																											
3.5180	Grp21																															
3.5556	Grp24	*	*																													
3.6382	Grp 3	*	*	*	*																											
3.6883	Grp22	*	*	*																												
3.7213	Grp25	*	*	*																												
3.7736	Grp 8	*	*	*	*			*																								
4.0515	Grp 9	*	*	*	*																											
4.0707	Grp19	*	*	*	*			*																								
4.2293	Grp 4	*	*	*	*			*																								
4.2869	Grp 2	*	*	*	*			*	*																							
4.3584	Grp 5	*	*	*	*			*	*			*																				
5.3189	Grp11	*	*	*	*																											
5.3450	Grp27	*	*	*	*			*	*																							
6.4653	Grp10	*	*	*	*	*		*	*	*		*																				

* Denotes pairs of groups significantly different at the .050 level

Table 25. Mean Productivity Values by Ecoregion.

	Softwood		Hardwood			
Ecoregion	SI	(N)	SI	(N)	MAI	(N)
1 BM (Boreal mixedwood)	14.59	(42)	15.50 a	(10)	3.50 a	(52)
2 L (Lowlands)	13.46	(30)	17.84 b	(18)	2.45 b	(48)
All	14.12	(72)	17.00	(28)	3.00	(100)

Note: Means with the same letter denote no significant difference between the means based on the Student-Newman-Keuls test with an alpha value of 0.05.

Table 26. Mean Productivity Values by Soil Type.

	Softwood		Hardwood			
Organic	SI	(N)	SI	(N)	MAI	(N)
0 Mineral soil	15.12 a	(62)	17.00	(28)	3.20 a	(90)
1 Organic soil	7.96 b	(10)	-		1.18 b	(10)
All	14.12	(72)	17.00	(28)	3.00	(100)

Note: Means with the same letter denote no significant difference between the means based on the Student-Newman-Keuls test with an alpha value of 0.05.

6.2.3 DISCUSSION

A number of runs were made to evaluate the impact of including covariates and more than one main factor at a time. Should covariates such as silt and clay content or slope be included in ANOVA? Should more than one factor be evaluated simultaneously? In this study, the answer to both questions is generally "no". The reason for this is that we have no _a priori_ method of deciding how the total sum of squares should be partitioned. In particular, the order in which we bring variables in to account for the total variation can significantly impact the results.

This is illustrated in Table 27. Clearly the conclusions drawn would be highly dependent on whether the main factor or the covariate was brought into the model first. Based on these results, as well as others not summarized here, it was decided to not include covariates or, with one exception, multiple factors.

Because of the importance of ecological moisture and nutrient regimes, these two factors were analyzed together. Table 28 summarizes the results of considering both regimes concurrently with both factors brought into the model simultaneously (regression approach in SPSSPC). For comparison, the results of analyzing each factor alone are duplicated from Table 13. For softwood SI and MAI, nutrient regime is not significant when considered concurrently with moisture regime even though it was significant when considered alone. For hardwood SI, moisture regime was not significant when considered alone but it becomes significant when nutrient regime is also included. Unfortunately, the significance of interaction effects cannot be evaluated because of empty cells.

Overall, the results of this study show that many of the variables used in site classification are significantly related to site productivity. An obvious extension to this study would be an examination of SI by individual species. However, since it is not practical to evaluate all species and site combinations, this would require that managers specify which species are important across which range of sites. Then an appropriate sampling scheme could be designed.

Table 27. Impact of Covariates on Softwood SI.

Option Used	Significance of F Statistic for: Position	Meso Slope Content	Siltclay Slope
No covariates	.013	-	-
Covariate first	.727	.000	-
Factor first	.007	.002	-
Covariate first	.391	-	.001
Factor first	.011	-	.092
Both simultaneously	.391	-	.092

Table 28. Site Productivity and Moisture and Nutrient Regimes.

Dependent Variable	Significance of F Statistic for: Moisture Regime	Nutrient Regime
Softwood SI	.000	-
Softwood SI	-	.004
Softwood SI	.000	.443
Hardwood SI	.121	-
Hardwood SI	-	.926
Hardwood SI	.048	.233
MAI	.000	-
MAI	-	.000
MAI	.001	.252

Finally it should be noted that simply sampling more trees at each existing plot would not significantly reduce the problem of confounding species and site factors. This is because trees sampled for site index calculations should be in dominant crown positions. Therefore, obtaining height-age data on trees of other species would not be valid unless these trees were also in dominant positions.

7.0 REFERENCES

Adams, G.D. 1985. A regional map base for a migratory bird habitat inventory, Prairie Provinces. Can. Wildlife Service, Saskatoon.

Alberta Forest Service. 1985. Alberta Phase 3 forest inventory: yield tables for unmanaged stands. Alberta Energy and Natural Resources Rep. No. Dept. 60a and 60b. 227 pp. and appendix.

Boyer, D. 1979. Guidelines for soil resource protection and restoration for timber harvest and post-harvest activities. U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Watershed Management.

Braun-Blanquet, J. 1932. Plant sociology; the study of plant communities. (Transl. by G.D. Fuller and H.S. Conard.) Transl. of 1st ed. of Pflanzensoziologie (1928). McGraw-Hill, New York and London. 438 p.

Canada Soil Survey Committee, Subcommittee on Soil Classification. 1978. The Canadian system of soil classification. Canada Department of Agriculture. Publication 1646. Supply and Services Canada, Ottawa, Ontario.

Corns, I.G.W. and R.M. Annas. 1986. Field guide to forest ecosystems of West-Central Alberta. Can. For. Serv., North. For. Cent., Edmonton, Alta. 251 pp.

Daubenmire, R.F. 1952. Forest vegetation of northern Idaho and adjacent Washington, and its bearing on concepts of vegetation classification. Ecol. Monogr. 22:301-330.

Daubenmire, R.F. 1959. Plants and Environment, 2d ed. John Wiley & Sons, Inc., New York. 422 pp.

Ehrlich, W.A., L.E. Pratt, and F.P. LeClaire. 1962. Detailed Reconnaissance soil survey of Swan River map sheet area. Manitoba Soil Survey Report No. 13. 79 pp.

Environmental Conservation Task Force. 1981. Ecological land survey guidelines for environmental impact analysis. Ecol. Land Classification Series No. 13. 42 pp.

Fraser, W. 1982. Soils of the Duck Mountain area. Canada-Manitoba Soil Survey Report D-42.

Harris, W.C., A. Kabzems, A. Kosowan, G. Padbury and J.S. Rowe. 1983. Ecological regions of Saskatchewan. Sask. Parks and Renew. Res. Tech. Bull. 10. 57 pp.

Hellum, A.K. 1974. Direct seeding in western Canada. Pages 103-111 in J.H. Cayford, ed. Proceedings of the direct seeding symposium, Timmins, Ont., Sept. 11-13, 1973. Eniron. Can., Can. For. Serv., Ottawa, Ontario. Publ. 1339.

Hill, M.O. 1979a. TWINSPAN -- A FORTRAN Program for arranging multi-variate data in an ordered two-way table by classification of the individuals and attributes. Cornell University, Ithaca, New York.

Hill, M.O. 1979b. DECORANA -- A FORTRAN Program for detrended correspondence analysis and reciprocal averaging. Cornell University, Ithaca, New York.

Jones, R.K. 1987. Site classification in Ontario: Review, evaluation and opportunities for integration with process models. Proc. IEA/FEA Workshop at Clemson Univ., Georgetown, S. Carolina. 31 pp.

Jones, R.K., G. Pierpoint, G.M. Wickware, J.K. Jeglum, R.W. Arnup, J.M. Bowles. 1983. Field guide to forest ecosystem classification for the clay belt. Ont. Min. of Nat. Res., Maple, Ontario.

Kabzems, A., A.L. Kosowan, and W.C. Harris. 1986. Mixedwood section in an ecological perspective, Saskatchewan. Saskatchewan Parks and Renewable Resources, Forestry Division. Technical Bulletin No. 8. Second Edition. 122 pp.

Krajina, V.J. 1965. Biogeoclimatic zones and classification of British Columbia. Ecology of Western North America 1:1-17.

McKeague, J.A. 1978. Manual on soil sampling and method of analysis. 2nd Ed., Can. Soc. Soil Sci.

Millar, J.B. 1976. Wetland classification in western Canada: A guide to marshes and shallow open water wetlands in the grasslands and parklands of the prairie provinces. Can. Wildl. Service Rep. Ser. No. 37. Map.

Mills, G.F. 1976 Biophysical land classification of northern Manitoba. Proc. 1st meeting Can. Comm. on Ecological Land Class. Petawawa, Ont. p. 201-219.

Mills, G. 1979. Ecologial regions and subregions in Manitoba. Manitoba Soil Survey Unpubl. Report. 15 pp.

Mills, G. 1980. Physiographic divisions of Manitoba. Manitoba Soil Survey. Map.

Mills, G. 1983. Generalized soil landscapes of Manitoba. Manitoba Soil Survey. Map.

Mills, G.F., H. Veldhuis, D.B. Forrester, and R. Schmidt. 1976. A guide to biophysical land classification in Manitoba. Dept. of Renewable Res. and Transportation Serv. and Canada-Manitoba Soil Survey Report. 25 pp.

Mueller-Dombois, D. 1964. The forest habitat types in southeastern Manitoba and their application to forest management. Can. J. Botany 42:1417-1444.

Mueller-Dombois, D. 1965. Eco-geographic criteria for mapping forest habitats in southeastern Manitoba. Forestry Chron. 41:188-206.

Norusis, M.J. 1986. SPSS/PC+: APSS for the IBM PC/XT/AT. SPSS Inc.

Pedocan Land Evaluation Ltd. 1983. Preliminary habitat regions/subregions of Alberta. Report for Alberta Energy and Natural Resources Fish and Wildlife Division. 19 pp. Map and extended legend.

Rowe, J.S. 1979. Revised working paper on methodology/philosophy of ecological land classification in Canada. p. 23-30 in Rubec, C.D.A., Ed. Proc. Second Meeting Canada Committee on Ecological (Biophysical) Land Classification. Dep. Eniron., Lands Dir., Ottawa, Ont.

Rowe, J.S. 1980. The common denominator of land classification in Canada: an ecological approach to mapping. For. Chron. 56:19-20.

Scoggan, H.J. 1957. Flora of Manitoba. Canada Dep. Nor. Affairs and National Res., National Museum of Canada. Bulletin No. 140. Biological Series No. 47. 619 pp.

Steel, R.D. and J.H. Torrie. 1980. Principles and procedures of statistics. New York: McGrass-Hill. 633 p.

Valentine, K.W.G. 1986. Soil Resource Surveys for Forestry. Clarendon Pres, Oxford. 147 pp.

Walmsley, M., G. Utzig, T. Vold, D. Moon and J. van Barneveld (eds.). 1980. Describing ecosystems in the field. Brit. Col. Min. Env., Res. Anal. Br. Tech. Pap. 2:224 pp.

Ward, J.H. 1963. Hierarchial grouping to optimize an objective function. J. Am. Stat. Assoc. 58: 236-244.

Wells, R.E. 1987. Development of a methodology and rationale for a forest management site classification system for Manitoba. Sci. Authority, Supply & Services Can. Contr. #01K45-6-0054.

Wiken, E.B., G.R. Ironside, T.W. Pierce. 1980. Ecodistrict information for northern land management. Proc. Ecol. Data Proc. and Interp. Workshop, Victoria. p. 353-368.

Wiken, E. 1985. Terrestrial ecozones of Canada. Lands Directorate. Ecol. Land Classification Series No. 19. 24 pp.

Wishart, D. 1978. Clustan 1C user manual, edition 3. Edinburgh University, Program Library Unit, Edinburgh, Scotland. 175 pp.

Zoltai, S.C., E.T. Oswald and C. Tarnocai. 1969. Land classification for land evaluation: Cormorant Lake Pilot Project. Forestry Branch, Dept. of Fisheries and Forestry Info. Report MS-X-20. 31 pp.

APPENDIX I

KEY TO THE FOREST ECOSYSTEMS

KEY TO THE FOREST ECOSYSTEMS

1a. Elevations above 610 m; Boreal Mixedwood Ecogregion . . . . key lead 2

1b. Elevations below 610 m; Mid-Boreal Lowlands Ecoregion . . . . key lead 11

2a. Broad-leaved tree dominant . . . . key lead 3

2b. Needle-leaved tree dominant . . . . key lead 5

3a. *Corylus cornuta* a dominant shrub; Aspen the dominant tree or mixed with white birch and balsam poplar; slopes >20% and generally south-facing; hummocky to ridged morainal landforms
BMW 1 *TA/Corylus/Aralia* - Waitville

3b. *Corylus cornuta* absent or of minor occurrence; *Viburnum edule* a common or dominant shrub and *Aralia nudicaulis* a dominant herb; morainal landforms with discontinuous lacustrine veneers . . . . key lead 4

4a. Aspen the dominant tree
BMW 5b *TA/Viburnum/Aralia* - Waitville (Duck Mountain)

4b. Balsam poplar the dominant tree
BMW 5c *BPO/Viburnum/Aralia* - Waitville (Duck Mountain)

4c. White birch the dominant tree
BMW 5d *WB/Viburnum/Aralia* - Waitville (Duck Mountain)

5a. Jack pine the dominant tree; black spruce may be co-dominant; *Lycopodium annotinum* a dominant herb; *L. complanatum* often present; hummocky to undulating morainal landforms
BMW 2 *JP/Lycopodium/Pleurozium* - Waitville

5b. Balsam fir the dominant tree; understory poorly developed due to dense tree cover
BMW 7 *BF* - Singush

5c. White spruce the dominant tree . . . . key lead 6

5d. Black spruce the dominant tree . . . . key lead 8

6a. Moss layer well developed; feather mosses usually have >50% cover; *Hylocomium splendens* and sometimes *Pleurozium schreberi* are dominant; landforms usually glaciolacustrine
BMW 4 *WS/Hylocomium* - Verrall Lake

6b. Moss layer poorly developed; moss cover usually <15%, shrub and/or herb layers usually well developed . . . . key lead 7

7a. *Equisetum arvense* a dominant herb; soils imperfectly drained; rare in study area
BMW 6 *WS/Equisetum* - Rackham

7b. *Equisetum arvense* sparse or absent; *Viburnum edule* a common or dominant shrub and *Aralia nudicaulis* a dominant herb; morainal landforms with discontinuous glaciolacustrine veneers
BMW 5a *WS/Viburnum/Aralia* - Waitville (Duck Mountain)

8a. Moss layer well developed; feather mosses and/or peat mosses usually have >50% cover . . . . key lead 9

8b. Moss layer poorly developed; moss cover usually < 15%; shrub and herb layers better developed; *Viburnum edule* a common shrub and *Aralia nudicaulis* a common herb; morainal landforms with discontinuous glaciolacustrine veneers
BMW 5e *BS/Viburnum/Aralia* - Waitville (Duck Mountain)

9a. Bog species common *(Rubus chamaemorus, Oxycoccus quadripetalus, Sphagnum spp.)*; soils poorly drained Mesisols and Gleysols; predominantly organic landforms . . . . key lead 10

9b. Bog species absent or uncommon; soils Gleysols and Luvisols on glaciolacustrine and morainal landforms; understory dominated by feather mosses, especially *Pleurozium schreberi* and *Hylocomium splendens*
BMW 3 *BS/Pleurozium* - Hylocomium - Breckon

10a. *Ledum groenlandicum* and feather mosses, especially *Pleurozium schreberi*, dominate the understory; soils are Mesisols and Gleysols
BMW 8 *BS/Ledum/Pleurozium* - Okno

10b. *Ledum groenlandicum* and peat mosses *(Sphagnum spp.)* dominate the understory; soils are mesisols
BMW 9 *BS/Ledum/Sphagnum* - Okno

11a. Broad-leaved tree dominant . . . . key lead 12

11b. Needle-leaved tree dominant . . . . key lead 17

12a. Aspen the dominant tree . . . . key lead 13

12b. White birch the dominant tree . . . . key lead 15

12c. Balsam poplar the dominant tree . . . . key lead 16

12d. White elm, the dominant tree; Green ash, Manitoba maple, aspen, and/or balsam poplar may be co-dominant; *Viburnum trilobum* and *Acer spicatum* are common shrubs and *Matteucia struthiopteris* a common herb; rich lowlands, especially along streams; rare in the study area
MBL 8c *WE/Acer/Matteucia* - Homestead

13a. *Arctostaphylos uva-ursi* a dominant dwarf-shrub; *Amelanchier alnifolia, Rosa spp.* and *Vaccinium myrtilloides* are co-dominant shrubs; soils are Brunisols and often gleyed
MBL 2b *TA/Amelanchier/Arctostaphylos* - Pine Ridge (Wintergreen)

13b. *Arctostaphylos uva-ursi* sparse or absent; *Acer spicatum* and *Corylus cornuta* are dominant shrubs; soils are predominantly Luvisols . . . . key lead 14

14a. *Acer spicatum* dominant in the usually dense shrub layer; *Matteucia struthiopteris* present in the usually sparse herb layer
MBL 6 *TA/Acer* - Duck Mountain

14b. *Corylus cornuta* the dominant shrub; *Matteucia struthiopteris* absent; herb layer is well developed and dominated by *Aralia nudicaulis* and *Rubus pubescens*
MBL 5a *Populus/Corylus/Aralia* - Pine Ridge/Waitville

15a. *Acer spicatum* dominant in the dense shrub layer; *Matteucia struthiopteris* usually present in the poorly developed herb layer; lowlands and valleys; soils are predominantly Regosols and Gleysols
MBL 8b *WB/Acer/Matteucia* - Homestead

15b. *Corylus cornuta* and/or *Diervilla lonicera* dominant in the shrub layer; *Rubus pubescens* and *Aralia nudicaulis* dominant herbs; soils are predominantly Luvisols
MBL 5b *WB/Corylus/Aralia* - Pine Ridge/Waitville

16a. *Acer spicatum* dominant in the dense shrub layer; *Matteucia struthiopteris* usually common in the herb layer; soils are predominantly Regosols and Gleysols
MBL 8a *BPO/Acer/Matteucia - Homestead*

16b. *Corylus cornuta* dominant or co-dominant in the shrub layer; *Matteucia struthiopteris* usually absent; *Aralia nudicaulis* and/or *Rubus pubescens* are dominant in the herb layer; soils are predominantly Luvisols
MBL 5a *Populus/Corylus/Aralia* - Pine Ridge/Waitville

17a. Jack pine the dominant tree . . . . key lead 18

17b. Balsam fir the dominant tree; understory poorly developed due to dense tree cover
MBL 9 *BF* - Waitville

17c. White spruce the dominant tree . . . . key lead 21

17d. Black spruce the dominant tree . . . . key lead 22

18a. *Corylus cornuta* and/or *Diervilla lonicera* dominant in the shrub layer; *Aralia nudicaulis* and *Rubus pubescens* dominant herbs; soils are predominantly Luvisols
MBL 5c *JP/Corylus/Aralia* - Waitville

18b. *Corylus* and *Diervilla* absent or sparse . . . . key lead 19

19a. *Hudsonia tomentosa* usually domiant in the otherwise sparse herb layer; Lichen layer often well developed and dominated by *Cladina mitis* and *Cladonia gracilis*; sand dunes
MBL 1 *JP/Hudsonia/Lichen* - Kettlehills

19b. *Hudsonia tomentosa* absent or sparse . . . . key lead 20

20a. *Ledum groenlandicum, Potentilla fruticosa* and *Betula glandulosa* are co-dominant in the shrub layer; *Linnaea borealis* is the dominant dwarf-shrub; soils are Gleysols and Gleyed Brunisols
MBL 3 *JP/Ledum/Linnaea* - Kerry

20b. *Vaccinium myrtilloides* and sometimes *Alnus crispa* and *Vaccinium caespitosum* are co-dominant in the shrub layer; herb layer is sparse; *Polytrichum juniperinum* and *Cladonia gracilis* are common in the moss and lichen layer; soils are Gleyed Brunisols
MBL 4 *JP/Vaccinium* - Lonesand

20c. *Amelanchier alnifolia* and/or *Rosa spp.* dominant in the shrub layer; *Arctostaphylos uva-uri, Linnaea borealis* and/or *Elymus innovatus* dominant in the herb layer; moss layer variable but often well represented by *Pleurozium schreberi* and *Cladina mitis*; soils are predominantly Brunisols
MBL 2a *JP/Amelanchier/Arctostaphylos - Pine Ridge*

20d. Shrub layer variable, often domintaed by *Alnus crispa* and/or *Rosa spp.*; *Rubus pubescens*, *Cornus canadensis*, and *Lycopodium annotinum* common in the herb layer; moss layer well developed (>60% cover) and dominated by *Pleurozium schreberi* and *Hylocomium splendens*
MBL 12 *JP/Pleurozium* - Waitville

21a. Moss layer well developed (>30% cover) and dominated by *Hylocomium splendens*; rare in study area
MBL 10 *WS/Hylocomium* - Novra

21b. Moss layer poorly developed (<10% cover); shrub layer dominated by *Cornus stolonifera* and herb layer by *Rubus pubescens*; rare in study area
MBL 7 *Picea/Cornus stolonifera* - Novra

22a. Bog species common (*Oxycoccus quadripetalus*, *Potentilla palustris*, *Sphagnum spp.*); shrub layer dominated by *Ledum groenlandicum* and moss layer by *Sphagnum spp.*; Soils are Mesisols and Gleysols
MBL 11 *BS/Ledum/Sphagnum* - Kirco

22b. Bog species absent or sparse . . . . key lead 23

23a. Moss layer well developed and dominated by *Pleurozium schreberi*, *Hylocomium splendens*, and/or *Ptilium crista-castrensis*; shrub and herb layers poorly developed; rare in study area
MBL 13 *BS/Pleurozium - Hylocomium* - Meleb

23b. Moss layer poorly developed; shrub and herb layers better developed and dominated by *Cornus stolonifera* and *Rubus pubescens*, respectively; rare in study area
MBL 7 *Picea/Cornus stolonifera* - Novra

APPENDIX II

VEGETATION DATA

BOREAL MIXEDWOOD ECOREGION

BMW I - TA/CORYLUS/ARALIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0018		000 0022	
NUMBER OF SPECIES PER PLOT	29.0		26		32	
SPECIES	P	MC	%C	SV	%C	SV
TREE LAYER						
1 POPU TRE M	100.0	5.5	04		07	
2 BETU PAP Y	50.0	5.5			11	
3 POPU BAL S	50.0	5.5	11			
4 PICE GLA U	50.0	1.5	03			
5 PICE MAR I	50.0	0.5	01			
SHRUB LAYER						
6 CORY COR N	100.0	25.0	25		25	
7 PRUN PEN S	100.0	4.5	06		03	
8 ROSA SPP .	100.0	4.0	05		03	
9 AMEL ALN I	100.0	2.5	03		02	
10 ALNU CRI S	100.0	2.0	01		03	
11 RUBU IDA E	100.0	1.8	.5		03	
POPU TRE M	100.0	1.5	02		01	
12 SYMP ALB U	100.0	1.0	01		01	
PICE GLA U	100.0	0.8	.5		01	
BETU PAP Y	50.0	1.0			02	
POPU BAL S	50.0	1.0	02			
13 SALI SPP .	50.0	0.5			01	
14 DIER LON I	50.0	0.3			.5	
15 LONI DIO I	50.0	0.3			.5	
16 SORB DEC O	50.0	0.3			.5	
17 VACC ANG U	50.0	0.3	.5			
18 VIBU EDU L	50.0	0.3	.5			
HERB AND DWARF SHRUB LAYER						
19 ARAL NUD I	100.0	25.0	25		25	
20 ELYM INN O	100.0	10.0	05		15	
21 FRAG VIR G	100.0	5.0	05		05	
22 ASTE CIL I	100.0	2.5	02		03	
23 CORN CAN A	100.0	2.5	03		02	
24 GALI BOR E	100.0	0.8	.5		01	
RUBU IDA E	50.0	2.5			05	
25 RUBU PUB E	50.0	2.0	04			
26 APOC AND R	50.0	1.5			03	
27 VIOL REN I	50.0	1.5	03			
28 AGRO TRA C	50.0	1.0			02	
29 MERT PAN I	50.0	0.5			01	
30 DISP TRA C	50.0	0.3			.5	
31 EPIL ANG U	50.0	0.3			.5	
32 HIER CAN A	50.0	0.3	.5			
33 LATH OCH R	50.0	0.3			.5	
34 PYRO SEC U	50.0	0.3			.5	
35 TARA OFF I	50.0	0.3	.5			
36 VICI AME R	50.0	0.3			.5	
MOSS AND LICHEN LAYER						
37 DREP UNC I	50.0	0.3			.5	

BOREAL MIXEDWOOD ECOREGION

BMW 2 - JP/LYCOPODIUM/PLEUROZIUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0001	000 0027	000 0031	000 0089	000 0096	000 0097	000 0099
NUMBER OF SPECIES PER PLOT	35.9		34	36	41	41	35	32	32
SPECIES	%P	MC	%C SV	%C SV	%C SV	%C SV	%C SV	%C SV	%C SV
TREE LAYER									
1 PINU BAN K	100.0	15.4	20	13	15	12	12	24	12
2 PICE MAR I	85.7	5.9	05	05	10	17	02	02	
3 BETU PAP Y	71.4	5.4	01			06	06	09	16
4 POPU TRE M	71.4	5.1		05		12	04	03	12
5 PICE GLA U	28.6	0.6				03	01		
SHRUB LAYER									
6 VIBU EDU L	100.0	1.0	.5	01	01	01	.5	01	02
PICE MAR I	85.7	2.4	07	03	02	01	02	02	
7 VACC MYR T	85.7	0.9	.5	04	.5	.5	.5		.5
8 LEDU GRO E	71.4	3.1	10	10	01			.5	.5
9 ROSA SPP .	71.4	0.9	01	02	02		.5		.5
POPU TRE M	71.4	0.6		01		01	.5	01	01
10 ALNU CRI S	57.1	2.1	09	05	.5		.5		
11 ABIE BAL S	57.1	1.8			02	.5	04	06	
12 RUBU IDA E	57.1	0.5	.5	.5	02				.5
13 SORB DEC O	57.1	0.4			01	01		.5	.5
BETU PAP Y	42.9	0.2			.5	.5		.5	
14 RIBE TRI S	28.6	0.2			.5	01			
15 ALNU RUG O	14.3	0.6	04						
16 AMEL ALN I	14.3	0.1		.5					
17 CORN ALT E	14.3	0.1			.5				
18 LONI DIO I	14.3	0.1	.5						
PICE GLA U	14.3	0.1							.5
19 RIBE GLA N	14.3	0.1				.5			
20 RIBE OXY C	14.3	0.1		.5					
21 SALI BEB B	14.3	0.1		.5					
22 VIBU TRI L	14.3	0.1				.5			
HERB AND DWARF SHRUB LAYER									
23 LYCO ANN O	100.0	11.0	07	05	20	15	08	13	09
24 ELYM INN O	100.0	6.9	05	25	.5	.5	02	.5	15
25 CORN CAN A	100.0	3.7	03	02	02	03	03	05	08
26 LINN BOR E	100.0	2.0	03	02	01	01	05	01	01
27 RUBU PUB E	100.0	2.0	.5	.5	01	10	.5	.5	01
28 PETA PAL M	100.0	1.4	05	01	.5	01	.5	.5	01
29 MERT PAN I	100.0	0.6	.5	01	.5	01	.5	.5	.5
30 PYRO SEC U	100.0	0.5	.5	.5	.5	.5	.5	.5	.5
31 PYRO ASA R	85.7	1.6	.5		.5	.5	01	04	05
32 VACC VIT I	85.7	1.5	03	03	.5		02	01	01
33 MAIA CAN A	85.7	0.6		01	.5	.5	.5	01	01
34 TRIE BOR E	85.7	0.5	.5		01	.5	.5	.5	.5
35 ARAL NUD I	71.4	6.9			04	20	.5	04	20
36 LYCO COM P	71.4	0.9		01	.5		03	01	01
37 FRAG VIR G	57.1	1.6		02		.5		.5	08
38 MITE NUD A	57.1	0.6			.5	02	01	01	
39 LATH OCH R	57.1	0.3		.5			.5	.5	.5
40 LYCO OBS C	42.9	0.5			02	01			.5
41 GALI TRI F	42.9	0.2	.5		.5	.5			
42 VIOL REN I	42.9	0.2			.5	.5		.5	
43 CALA CAN A	28.6	1.5			.5				10
44 GALI BOR E	28.6	0.4		02		.5			
45 EPIL ANG U	28.6	0.2	.5	01					
46 DRYO SPI N	28.6	0.1			.5	.5			
47 GOOD REP E	28.6	0.1			.5		.5		
48 HABE ORB I	28.6	0.1					.5		.5
49 STRE AMP L	28.6	0.1			.5	.5			
50 VICI AME R	28.6	0.1					.5		.5
51 EQUI PRA T	14.3	0.4	03						
52 ACTE RUB R	14.3	0.1				.5			
53 ASTE CIL I	14.3	0.1							.5
54 COPT TRI F	14.3	0.1	.5						
55 CORA MAC U	14.3	0.1	.5						
56 EQUI ARV E	14.3	0.1				.5			
57 GEOC LIV I	14.3	0.1	.5						
58 HIER CAN A	14.3	0.1		.5					
59 MITE NUD I	14.3	0.1	.5						
60 MONO UNI F	14.3	0.1	.5						
61 SCHI PUR P	14.3	0.1		.5					
MOSS AND LICHEN LAYER									
62 HYLO SPL E	85.7	7.7	10	03	15	03	08	15	
63 PTIL CRI S	85.7	2.7	01	03	15	.5	.5	.5	
64 PLEU SCH R	85.7	18.6	40	55	15	03	07	10	
65 BRAC POP U	28.6	0.8		.5	05				
66 DICR POL Y	28.6	0.1		.5			.5		
68 CLAV LIG U	14.3	0.1			.5				
69 RHYT TRI Q	14.3	0.1				.5			

BOREAL MIXEDWOOD ECOREGION

BMW 3 - BS/PLEUROZIUM-HYLOCOMIUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0077	000 0095	000 0098
NUMBER OF SPECIES PER PLOT	27.7		16	34	33
SPECIES	%P	MC	%C SV	%C SV	%C SV
TREE LAYER					
1 PICE MAR I	100.0	24.7	34	15	25
2 PINU BAN K	66.7	1.7	03	02	
3 POPU TRE M	33.3	6.0		18	
4 PICE GLA U	33.3	2.3			07
5 POPU BAL S	33.3	0.7			02
SHRUB LAYER					
6 VACC MYR T	100.0	1.3	.5	03	.5
7 ROSA SPP .	100.0	0.7	.5	01	.5
8 LEDU GRO E	66.7	0.8		02	.5
9 VIBU EDU L	66.7	0.3		.5	.5
10 ALNU CRI S	33.3	1.7		05	
PICE MAR I	33.3	0.3		01	
11 ALNU RUG O	33.3	0.2			.5
12 BETU PAP Y	33.3	0.2	.5		
POPU BAL S	33.3	0.2			.5
POPU TRE M	33.3	0.2		.5	
13 RIBE OXY C	33.3	0.2			.5
14 RUBU IDA E	33.3	0.2		.5	
HERB AND DWARF SHRUB LAYER					
15 CORN CAN A	100.0	4.8	.5	10	04
16 LINN BOR E	100.0	1.2	.5	02	01
17 PETA PAL M	100.0	1.2	.5	02	01
18 EQUI ARV E	100.0	0.5	.5	.5	.5
19 RUBU PUB E	66.7	2.3		05	02
20 VACC VIT I	66.7	1.7		04	01
21 FRAG VIR G	66.7	1.5		.5	04
22 ASTE CIL I	66.7	1.2		.5	03
23 MERT PAN I	66.7	1.2		03	.5
24 EQUI SYL V	66.7	0.3		.5	.5
25 LYCO COM P	33.3	1.0		03	
26 CARE VAG I	33.3	0.7			02
27 LYCO ANN O	33.3	0.7		02	
28 MITE NUD A	33.3	0.3			01
29 PYRO ASA R	33.3	0.3		01	
30 ACTE RUB R	33.3	0.2			.5
31 BROM CIL I	33.3	0.2			.5
32 CARE SPP .	33.3	0.2	.5		
33 DISP TRA C	33.3	0.2		.5	
34 ELYM INN O	33.3	0.2			.5
35 EPIL ANG U	33.3	0.2		.5	
36 EQUI SCI R	33.3	0.2			.5
37 HABE ORB I	33.3	0.2		.5	
38 LATH OCH R	33.3	0.2		.5	
39 OSMO CHI L	33.3	0.2			.5
40 PETA SAG G	33.3	0.2	.5		
41 SOLI HIS P	33.3	0.2			.5
42 TARA OFF I	33.3	0.2			.5
43 TRIE BOR E	33.3	0.2			.5
44 VIOL REN I	33.3	0.2		.5	
MOSS AND LICHEN LAYER					
45 PLEU SCH R	100.0	37.7	80	28	05
46 HYLO SPL E	100.0	23.3	13	37	20
47 PTIL CRI S	33.3	2.3	07		
48 CLAV LIG U	33.3	0.2	.5		
49 DICR POL Y	33.3	0.2			.5
50 DREP UNC I	33.3	0.2		.5	
51 PELT APT H	33.3	0.2	.5		
52 PLAG DRU M	33.3	0.2		.5	
53 RHYT TRI Q	33.3	0.2		.5	

BOREAL MIXEDWOOD ECOREGION

BMW 4 - WS/HYLOCOMIUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0010	000 0029	000 0079	000 0100
NUMBER OF SPECIES PER PLOT	34.5		37	30	37	34
SPECIES	%P	MC	%C SV	%C SV	%C SV	%C SV
TREE LAYER						
1 PICE MAR I	100.0	5.9	.5	18	03	02
2 PICE GLA U	75.0	18.5	30		10	34
3 PINU BAN K	50.0	1.3		04		01
4 POPU TRE M	50.0	1.3		03	02	
5 POPU BAL S	25.0	0.8			03	
6 BETU PAP Y	25.0	0.5			02	
SHRUB LAYER						
7 VIBU EDU L	100.0	1.1	02	.5	01	01
8 ROSA SPP .	100.0	0.6	.5	.5	01	.5
9 ABIE BAL S	75.0	14.0	30		11	15
10 RIBE TRI S	75.0	0.4	.5		.5	.5
11 ALNU CRI S	50.0	1.0	03	01		
BETU PAP Y	50.0	0.3	.5		.5	
POPU TRE M	50.0	0.3		.5		.5
12 RUBU IDA E	50.0	0.3	.5			.5
13 SORB DEC O	50.0	0.3	.5		.5	
PICE MAR I	25.0	0.8		03		
14 VACC MYR T	25.0	0.5		02		
15 CORN STO L	25.0	0.1				.5
16 LEDU GRO E	25.0	0.1		.5		
17 LONI DIO I	25.0	0.1		.5		
18 RIBE HIR T	25.0	0.1				.5
19 RIBE OXY C	25.0	0.1				.5
20 SYMP ALB U	25.0	0.1			.5	
HERB AND DWARF SHRUB LAYER						
21 CORN CAN A	100.0	3.5	02	05	05	02
22 MERT PAN I	100.0	3.5	04	01	08	01
23 ASTE CIL I	100.0	2.8	.5	.5	05	05
24 LINN BOR E	100.0	2.5	01	.5	.5	08
25 ELYM INN O	100.0	0.9	01	01	01	.5
26 CALA CAN A	100.0	0.6	.5	01	.5	.5
27 ARAL NUD I	75.0	7.8	18		08	05
28 RUBU PUB E	75.0	4.0	05		07	04
29 FRAG VIR G	75.0	2.1		.5	05	03
30 PYRO ASA R	75.0	1.8	01		03	03
31 PETA PAL M	100.0	1.3	01	02	01	01
32 GALI TRI F	75.0	0.5	01		.5	.5
33 LATH OCH R	75.0	0.4		.5	.5	.5
34 MITE NUD A	50.0	3.3			08	05
35 LYCO ANN O	50.0	1.0	03	01		
36 EQUI ARV E	50.0	0.4			01	.5
37 PYRO SEC U	50.0	0.4	.5		01	
38 ACTE RUB R	50.0	0.3		.5	.5	
39 GOOD REP E	50.0	0.3	.5	.5		
40 MAIA CAN A	50.0	0.3	.5			.5
41 VIOL REN I	50.0	0.3	.5		.5	
42 MITE NUD I	25.0	1.0	04			
43 LYCO COM P	25.0	0.8		03		
45 COPT GRO E	25.0	0.1	.5			
46 DRYO SPI N	25.0	0.1	.5			
47 EPIL ANG U	25.0	0.1		.5		
48 EQUI PRA T	25.0	0.1	.5			
49 EQUI SYL V	25.0	0.1		.5		
50 GALI BOR E	25.0	0.1			.5	
51 HERA LAN A	25.0	0.1			.5	
52 OSMO CHI L	25.0	0.1				.5
53 PREN ALB A	25.0	0.1				.5
54 SCHI PUR P	25.0	0.1	.5			
55 STRE AMP L	25.0	0.1	.5			
56 TRIE BOR E	25.0	0.1	.5			
57 VACC VIT I	25.0	0.1		.5		
58 VICI AME R	25.0	0.1			.5	
MOSS AND LICHEN LAYER						
59 HYLO SPL E	100.0	49.5	37	88	25	48
60 PLEU SCH R	75.0	10.5	37	04		01
61 PLAG DRU M	50.0	1.8	05		02	
62 PTIL CRI S	50.0	1.0	01	03		
63 EURY PUL C	25.0	0.8			03	
64 SPLA SPP .	25.0	0.3				01
65 AULA PAL U	25.0	0.1				.5
66 THUI REC O	25.0	0.1			.5	

BOREAL MIXEDWOOD ECOREGION

BMW 5a - WS/VIBURNUM/ARALIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0006	000 0036	000 0072	000 0073	000 0074	000 0075	000 0076	000 0091
NUMBER OF SPECIES PER PLOT	39.8		35	46	39	42	40	39	43	34
SPECIES	%P	MC	%C SV	%C SV	%C SV	%C SV	%C SV	%C SV	%C SV	%C SV
TREE LAYER										
1 PICE GLA U	100.0	20.6	12	17	20	35	35	18	07	21
2 BETU PAP Y	75.0	5.9	03	04			03	10	15	12
3 ABIE BAL S	37.5	2.1	01	01	15					
4 PICE MAR I	25.0	2.1							10	07
5 POPU TRE M	25.0	1.3	08						02	
6 PINU BAN K	12.5	0.4							03	
7 POPU BAL S	12.5	0.3	02							
SHRUB LAYER										
8 VIBU EDU L	100.0	6.6	03	03	15	05	02	03	02	20
9 ROSA SPP .	100.0	1.5	.5	.5	02	.5	02	05	01	.5
10 RIBE TRI S	87.5	0.7	.5		.5	01	02	.5	.5	.5
ABIE BAL S	75.0	8.5		10	10	04	30	05	09	
11 SORB DEC O	62.5	0.5	.5	.5	.5		.5			02
12 ALNU CRI S	50.0	7.4	50		08			.5	.5	
13 RUBU IDA E	50.0	2.6	07	05		01		08		
14 DIER LON I	37.5	1.4				01		08	02	
15 SYMP ALB U	50.0	0.8			01			04	01	15
POPU BAL S	37.5	0.2	.5			.5				.5
POPU TRE M	37.5	0.2				.5			.5	.5
16 PRUN VIR G	37.5	0.2			.5			.5	.5	
17 RIBE HIR T	37.5	0.2			.5	.5		.5		
18 ALNU RUG O	25.0	1.4			01	10				
19 ACER SPI C	25.0	1.0		02	06					
20 CORY COR N	25.0	0.8						06	.5	
BETU PAP Y	25.0	0.6		.5		04				
21 RIBE OXY C	25.0	0.1	.5						.5	
22 VACC MYR T	25.0	0.1		.5			.5			
23 CORN STO L	12.5	0.5			04					
24 AMEL ALN I	12.5	0.1	.5							
25 CORN ALT E	12.5	0.1							.5	
26 LONI DIO I	12.5	0.1		.5						
27 RIBE LAC U	12.5	0.1		.5						
28 SALI BEB B	12.5	0.1	.5							
HERB AND DWARF SHRUB LAYER										
30 ARAL NUD I	100.0	16.9	20	08	12	15	25	15	15	25
31 RUBU PUB E	100.0	14.4	25	20	10	10	15	05	10	20
32 CORN CAN A	100.0	8.9	03	05	20	20	05	10	05	03
33 MERT PAN I	100.0	3.5	04	04	02	03	04	05	02	04
34 ASTE CIL I	100.0	3.3	.5	01	06	05	.5	03	02	08
35 VIOL REN I	87.5	1.4	.5	02	02		.5	05	.5	.5
36 GALI TRI F	87.5	0.6	01	01	.5		.5	01	.5	.5
37 LATH OCH R	87.5	0.5	.5		.5	.5	.5	01	.5	.5
38 ACTE RUB R	87.5	0.4	.5	.5		.5	.5	.5	.5	.5
39 MITE NUD A	75.0	3.5		02	10	04	05	02		05
40 PETA PAL M	75.0	0.9	.5	02		01	02	01		01
41 MAIA CAN A	75.0	0.8		02	.5	01	01		.5	01
42 GALI BOR E	75.0	0.4			.5	.5	.5	.5	.5	.5
43 TRIE BOR E	75.0	0.4		.5		.5	.5	.5	.5	.5
44 LINN BOR E	62.5	1.5		05		02	02		02	01
45 FRAG VIR G	62.5	1.3		01	03		04		01	01
46 EQUI ARV E	62.5	0.7	03	.5		01		.5		.5
47 DRYO SPI N	62.5	0.6	01	01		01	.5	01		
48 EPIL ANG U	62.5	0.4	.5	.5		.5	.5	01		
49 STRE AMP L	62.5	0.3		.5		.5	.5	.5		.5
50 LYCO ANN O	50.0	2.6		03		01	13	04		
51 CINN LAT I	50.0	0.6		.5	01	02	01			
52 CALA CAN A	37.5	2.6	20					.5		.5
53 PYRO ASA R	50.0	1.3			02			03	02	03
54 PYRO SEC U	37.5	0.3					.5		.5	01
55 EQUI SYL V	37.5	0.2		.5		.5	.5			
56 OSMO LON G	37.5	0.2				.5	.5	.5		
57 ELYM INN O	25.0	0.6			01				04	
58 MILL EFF U	25.0	0.3		.5				02		
59 BOTR VIR G	25.0	0.1			.5	.5				
60 CARE SPP .	25.0	0.1			.5					.5
61 CIRC ALP I	25.0	0.1		.5		.5				
63 AGRO REP E	12.5	0.1		.5						
64 ANEM QUI N	12.5	0.1			.5					
65 BROM CIL I	12.5	0.1		.5						
66 CARE VAG I	12.5	0.1				01				
67 COPT TRI F	12.5	0.1					01			
68 DISP TRA C	12.5	0.1				.5				
69 EQUI PRA T	12.5	0.1			.5					
70 EQUI SCI R	12.5	0.1			.5					
71 GOOD REP E	12.5	0.1			.5					
72 HERA LAN A	12.5	0.1		.5						
73 LUZU PAR V	12.5	0.1		.5						
74 MITE NUD I	12.5	0.1	01							
75 OSMO CHI L	12.5	0.1		.5						
76 SCHI PUR P	12.5	0.1							.5	
77 SMIL STE L	12.5	0.1			01					
78 URTI DIO I	12.5	0.1	.5							
79 VICI AME R	12.5	0.1	.5							
MOSS AND LICHEN LAYER										
80 PLAG DRU M	75.0	1.2	01		.5	05	02	.5	.5	
81 BRAC POP U	62.5	0.9	.5	01			04	.5	01	
82 PTIL CRI S	62.5	0.5		02		.5	.5	.5	.5	
83 HYLO SPL E	50.0	7.0		05		20	30		01	
84 PLEU SCH R	50.0	4.2		03		20	10			.5
85 DREP UNC I	37.5	0.3						.5	01	.5
86 CLAV LIG U	37.5	0.2		.5			.5		.5	
87 RHYT TRI Q	12.5	0.6				05				
88 BRAC REF L	12.5	0.1	.5							
89 BRAC RUT A	12.5	0.1					.5			
90 DICR POL Y	12.5	0.1							01	
91 EURY PUL C	12.5	0.1			.5					
92 PELT POL Y	12.5	0.1							.5	
93 THUI REC O	12.5	0.1			.5					

BOREAL MIXEDWOOD ECOREGION

BMW 5b - TA/VIBURNUM/ARALIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0002	000 0003	000 0005	000 0019	000 0025	000 0026
NUMBER OF SPECIES PER PLOT	35.7		31	33	40	38	32	40
SPECIES	%P	MC	%C SV	%C SV	%C SV	%C SV	%C SV	%C SV
TREE LAYER								
1 POPU TRE M	100.0	13.5	25	10	12	20	09	05
2 PICE MAR I	100.0	3.7	02	01	02	04	05	08
3 POPU BAL S	83.3	5.0	10	02		04	06	08
4 PICE GLA U	66.7	2.0		04	02	04		02
5 BETU PAP Y	50.0	0.8	01	02	02			
6 PINU BAN K	33.3	1.0			05		01	
SHRUB LAYER								
7 ALNU CRI S	100.0	20.5	15	06	10	07	50	35
8 VIBU EDU L	100.0	3.8	01	10	04	05	02	01
9 ROSA SPP .	100.0	1.3	01	02	01	03	.5	.5
10 RUBU IDA E	83.3	2.1	01	02	04		05	.5
11 SALI BEB B	66.7	1.2	04	.5	02			.5
POPU BAL S	66.7	1.0		03		.5	02	.5
POPU TRE M	66.7	1.0	.5	04	01	.5		
12 RIBE TRI S	66.7	0.4			.5	01	.5	.5
BETU PAP Y	50.0	0.6		01	02	.5		
13 LEDU GRO E	50.0	0.3			01	.5	.5	
PICE GLA U	33.3	0.4		02		.5		
14 SYMP ALB U	50.0	0.3				.5	01	.5
15 AMEL ALN I	33.3	0.2	.5					.5
16 SORB DEC O	33.3	0.2			.5	.5		
PICE MAR I	16.7	0.5			03			
17 CORN ALT E	16.7	0.3						02
18 LONI DIO I	16.7	0.2		01				
19 RIBE OXY C	16.7	0.2						01
20 VACC MYR T	16.7	0.2			01			
21 BETU GLA N	16.7	0.1						.5
22 CORY COR N	16.7	0.1				.5		
HERB AND DWARF SHRUB LAYER								
24 RUBU PUB E	100.0	6.6	03	.5	20	08	05	03
25 MERT PAN I	100.0	3.6	.5	04	03	05	06	03
26 PYRO ASA R	100.0	1.0	02	.5	.5	.5	.5	02
27 ARAL NUD I	83.3	16.2	50	02	25		10	10
28 ELYM INN O	83.3	5.4	.5	05	06	20	01	
29 CALA CAN A	83.3	3.2	02	10	04	02		01
30 ASTE CIL I	83.3	3.1	01	01	.5		06	10
31 CORN CAN A	83.3	2.3		02	04	05	.5	02
32 EPIL ANG U	83.3	1.3	02	04	01	.5	.5	
33 PETA PAL M	100.0	1.1	.5	03	.5	01	.5	01
34 GALI BOR E	83.3	0.4	.5	.5	.5		.5	.5
35 GALI TRI F	83.3	0.4	.5		.5	.5	.5	.5
36 LYCO ANN O	66.7	2.9			01	.5	15	01
37 MAIA CAN A	66.7	0.4	01		.5	.5	.5	
38 ACTE RUB R	66.7	0.3	.5	.5			.5	.5
39 FRAG VIR G	50.0	2.3				08	04	02
40 LINN BOR E	50.0	0.4			01	01	.5	
41 EQUI SYL V	50.0	0.3	.5			.5	.5	
42 LATH OCH R	50.0	0.3		.5	.5	.5		
43 VICI AME R	50.0	0.3	.5	.5	.5			
44 BROM CIL I	33.3	0.3	.5				01	
45 MITE NUD A	33.3	0.3					01	01
46 EQUI PRA T	33.3	0.2				.5		.5
47 OSMO LON G	33.3	0.2			.5			.5
48 VIOL REN I	33.3	0.2	.5			.5		
49 BROM POR T	16.7	0.3						02
50 EQUI ARV E	16.7	0.3		02				
52 SCHI PUR P	16.7	0.2						01
53 SOLI CAN A	16.7	0.2	01					
54 AGRO SCA B	16.7	0.1						.5
55 APOC AND R	16.7	0.1		.5				
56 DISP TRA C	16.7	0.1			.5			
57 DRYO SPI N	16.7	0.1	.5					
58 HABE ORB I	16.7	0.1			.5			
59 HERA LAN A	16.7	0.1		.5				
60 HIER CAN A	16.7	0.1			.5			
61 LYCO OBS C	16.7	0.1			.5			
62 MITE NUD I	16.7	0.1				.5		
63 PYRO SEC U	16.7	0.1				.5		
64 THAL VEN U	16.7	0.1						.5
65 TRIE BOR E	16.7	0.1				.5		
MOSS AND LICHEN LAYER								
66 BRAC POP U	66.7	0.6		01	.5		01	01
67 HYLO SPL E	16.7	0.2						01
68 PLEU SCH R	16.7	0.2	01					
69 BRAC REF L	16.7	0.1				.5		
70 PLAG DRU M	33.3	0.2				.5		.5
72 SPLA SPP .	16.7	0.1						.5

BOREAL MIXEDWOOD ECOREGION

BMW 5c - BPO/VIBURNUM/ARALIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0090	
NUMBER OF SPECIES PER PLOT	38.0		38	
SPECIES	%P	MC	%C	SV
TREE LAYER				
1 POPU BAL S	100.0	18.0	18	
2 PICE MAR I	100.0	9.0	09	
3 PICE GLA U	100.0	3.0	03	
SHRUB LAYER				
4 VIBU EDU L	100.0	30.0	30	
5 ALNU CRI S	100.0	12.0	12	
6 RUBU IDA E	100.0	5.0	05	
7 CORY COR N	100.0	1.0	01	
POPU BAL S	100.0	1.0	01	
8 ROSA SPP .	100.0	1.0	01	
9 BETU PAP Y	100.0	0.5	.5	
10 LONI DIO I	100.0	0.5	.5	
PICE GLA U	100.0	0.5	.5	
11 RIBE GLA N	100.0	0.5	.5	
12 SYMP ALB U	100.0	0.5	.5	
HERB AND DWARF SHRUB LAYER				
13 ARAL NUD I	100.0	25.0	25	
14 RUBU PUB E	100.0	20.0	20	
15 LYCO ANN O	100.0	8.0	08	
16 VIOL REN I	100.0	5.0	05	
17 MERT PAN I	100.0	4.0	04	
18 ASTE CIL I	100.0	3.0	03	
19 CALA CAN A	100.0	3.0	03	
20 CORN CAN A	100.0	3.0	03	
21 FRAG VIR G	100.0	2.0	02	
22 MITE NUD A	100.0	2.0	02	
23 EPIL ANG U	100.0	1.0	01	
24 ACTE RUB R	100.0	0.5	.5	
25 ATHY FIL I	100.0	0.5	.5	
26 ELYM INN O	100.0	0.5	.5	
27 EQUI ARV E	100.0	0.5	.5	
28 EQUI SYL V	100.0	0.5	.5	
29 GALI BOR E	100.0	0.5	.5	
30 GALI TRI F	100.0	0.5	.5	
31 PETA PAL M	100.0	0.5	.5	
32 TRIE BOR E	100.0	0.5	.5	
33 VICI AME R	100.0	0.5	.5	
MOSS AND LICHEN LAYER				
34 DREP UNC I	100.0	0.5	.5	
35 PLAG DRU M	100.0	0.5	.5	
36 PLEU SCH R	100.0	0.5	.5	

BOREAL MIXEDWOOD ECOREGION

BMW 5d - WB/VIBURNUM/ARALIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0007	000 0020	000 0023	000 0032	000 0033	000 0034	000 0092	000 0093
NUMBER OF SPECIES PER PLOT	36.3		38	38	36	38	29	42	35	34
SPECIES	%P	MC	%C SV	%C SV	%C SV	%C SV	%C SV	%C SV	%C SV	%C SV
TREE LAYER										
1 BETU PAP Y	100.0	21.5	15	16	20	30	10	25	32	24
2 PICE MAR I	87.5	7.5		10	16	01	17	05	08	03
3 POPU TRE M	87.5	5.5	05	04	05		06	05	09	10
4 PICE GLA U	62.5	1.4	04		04			01	01	01
5 POPU BAL S	25.0	0.1				.5	.5			
6 PINU BAN K	12.5	0.4		03						
SHRUB LAYER										
7 VIBU EDU L	100.0	6.1	20	01	01	15	02	03	03	04
POPU TRE M	100.0	0.8	02	01	.5	.5	.5	.5	.5	.5
8 ABIE BAL S	75.0	0.9			.5	04	.5	.5	.5	01
9 ROSA SPP .	75.0	0.9	.5	01	.5	04			.5	.5
10 RIBE TRI S	62.5	0.4	.5		01	01	.5	.5		
11 SORB DEC O	62.5	0.4	.5	.5	.5	01	.5			
PICE MAR I	50.0	0.8		01		02		02		01
PICE GLA U	50.0	0.3	.5					.5	.5	01
12 ALNU CRI S	50.0	4.6	.5	01		10				25
13 SYMP ALB U	37.5	0.3						.5	.5	01
14 RUBU IDA E	25.0	0.4	02					01		
BETU PAP Y	25.0	0.2		01					.5	
15 CORN ALT E	25.0	0.2				.5				01
16 RIBE GLA N	25.0	0.1						.5	.5	
17 ACER SPI C	12.5	0.1			.5					
19 CORY COR N	12.5	0.1			.5					
20 LONI DIO I	12.5	0.1							.5	
POPU BAL S	12.5	0.1	.5							
21 SALI BEB B	12.5	0.1	.5							
22 VACC MYR T	12.5	0.1		.5						
HERB AND DWARF SHRUB LAYER										
23 ARAL NUD I	100.0	24.4	75	05	18	20	25	07	25	20
24 CORN CAN A	100.0	3.9	03	04	01	05	03	06	04	05
25 PYRO ASA R	100.0	2.3	01	03	.5	02	02	03	05	02
26 MERT PAN I	100.0	1.4	02	.5	.5	02	01	01	02	02
27 LINN BOR E	100.0	1.2	.5	.5	.5	01	01	02	01	03
28 TRIE BOR E	100.0	0.5	.5	.5	.5	.5	.5	.5	.5	.5
29 RUBU PUB E	87.5	5.7	15		.5	03	03	02	10	12
30 LYCO ANN O	87.5	4.6	01	03	10	.5		02	15	05
31 ASTE CIL I	100.0	1.5	.5	.5	03	03	01	01	01	02
32 GALI TRI F	87.5	0.6	01		.5	.5	.5	01	.5	.5
33 MAIA CAN A	87.5	0.4	.5	.5	.5		.5	.5	.5	.5
34 MITE NUD A	75.0	1.9			01	02	02	03	04	03
35 CALA CAN A	75.0	1.5	04	.5		01		.5	01	05
36 PETA PAL M	100.0	1.1	.5	02	01	.5	.5	01	02	01
37 ACTE RUB R	62.5	0.4	.5		.5	.5	01	.5		
38 PYRO SEC U	62.5	0.3		.5	.5			.5	.5	.5
39 ELYM INN O	50.0	1.6		04				.5	.5	08
40 VIOL REN I	50.0	0.8	02		01			01		02
41 LATH OCH R	50.0	0.3	.5			.5		.5	.5	
42 STRE AMP L	50.0	0.3			.5	.5		.5	.5	
43 EPIL ANG U	37.5	0.7	04			01		.5		
44 CINN LAT I	37.5	0.3				.5	01	.5		
45 LYCO OBS C	37.5	0.3			.5				.5	01
46 DRYO SPI N	37.5	0.2			.5			.5		.5
47 GALI BOR E	37.5	0.2	.5				.5	.5		
49 EQUI SYL V	25.0	0.1				.5	.5			
50 MILL EFF U	25.0	0.1				.5			.5	
51 OSMO CHI L	25.0	0.1				.5		.5		
52 SCHI PUR P	25.0	0.1		.5			.5			
54 MITE NUD I	12.5	0.3	02							
55 ANEM QUI N	12.5	0.1							.5	
56 EQUI ARV E	12.5	0.1	.5							
57 FRAG VIR G	12.5	0.1				.5				
58 GYMN DRY O	12.5	0.1			.5					
59 HABE ORB I	12.5	0.1		.5						
60 HIER CAN A	12.5	0.1	.5							
61 LYCO COM P	12.5	0.1		01						
62 OSMO LON G	12.5	0.1							.5	
64 SOLI HIS P	12.5	0.1		.5						
65 VIOL NEP H	12.5	0.1						01		
MOSS AND LICHEN LAYER										
66 HYLO SPL E	62.5	0.8	.5	03	01	.5	01			
67 BRAC POP U	50.0	0.3				.5	01	.5		.5
68 PLEU SCH R	50.0	0.3	.5	.5	.5		.5			
69 DREP UNC I	50.0	0.3		.5	.5	.5				.5
70 PLAG DRU M	25.0	0.1	.5			.5				
71 BRAC REF L	12.5	0.1	01							
72 BRAC SAL E	12.5	0.1		.5						
73 CLAV LIG U	12.5	0.1		.5						
74 DICR FUS C	12.5	0.1						.5		
76 LEPI REP T	12.5	0.1		.5						
77 PELT APT H	12.5	0.1		.5						
78 POHL NUT A	12.5	0.1		.5						
79 POLY COM M	12.5	0.1						.5		
80 PTIL CRI S	12.5	0.1		.5						

BOREAL MIXEDWOOD ECOREGION

BMW 5e - BS/VIBURNUM/ARALIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0011	000 0024	000 0030	000 0035
NUMBER OF SPECIES PER PLOT	36.8		38	37	33	39
SPECIES	%P	MC	%C SV	%C SV	%C SV	%C SV
TREE LAYER						
1 PICE MAR I	100.0	17.3	21	10	26	12
2 BETU PAP Y	100.0	3.0	04	03	01	04
3 POPU TRE M	75.0	7.5		08	12	10
4 PINU BAN K	75.0	1.6	05		01	.5
5 PICE GLA U	50.0	0.5		01		01
6 POPU BAL S	25.0	0.8		03		
SHRUB LAYER						
7 ABIE BAL S	100.0	3.3	07	05	.5	.5
POPU TRE M	100.0	1.6	.5	01	02	03
8 VIBU EDU L	100.0	0.8	.5	01	.5	01
9 VACC MYR T	75.0	1.5		.5	05	.5
10 ROSA SPP .	75.0	0.9		.5	02	01
11 RUBU IDA E	75.0	0.5	.5	.5	01	
PICE MAR I	50.0	0.4	.5			01
BETU PAP Y	50.0	0.3		.5		.5
12 SORB DEC O	50.0	0.3	.5	.5		
13 ALNU CRI S	25.0	0.3			01	
14 ACER SPI C	25.0	0.1				.5
15 CORY COR M	25.0	0.1		.5		
16 DIER LON I	25.0	0.1		.5		
17 LONI VIL L	25.0	0.1			.5	
POPU BAL S	25.0	0.1		.5		
18 RIBE TRI S	25.0	0.1				.5
20 SYMP ALB U	50.0	0.3		.5		.5
HERB AND DWARF SHRUB LAYER						
21 LINN BOR E	100.0	2.8	01	01	04	05
22 ARAL NUD I	100.0	2.1	.5	04	01	03
23 MERT PAN I	100.0	0.9	.5	01	01	01
24 LATH OCH R	100.0	0.5	.5	.5	.5	.5
25 MAIA CAN A	100.0	0.5	.5	.5	.5	.5
26 CORN CAN A	75.0	1.8	01	03		03
27 LYCO ANN O	75.0	1.8	01		03	03
28 ASTE CIL I	75.0	1.6	.5	04	02	
29 RUBU PUB E	100.0	2.0	01	02	03	02
30 PETA PAL M	75.0	0.9	.5	02	01	
31 PYRO ASA R	75.0	0.5	.5	.5	01	
32 GALI TRI F	75.0	0.4	.5		.5	.5
33 PYRO SEC U	75.0	0.4	.5	.5		.5
34 ELYM INN O	50.0	1.0		03		01
35 FRAG VIR G	50.0	0.6			02	.5
36 LYCO OBS C	50.0	0.4	.5		01	
37 MITE NUD I	50.0	0.4	.5	01		
38 ACTE RUB R	50.0	0.3	.5			.5
39 GALI BOR E	50.0	0.3		.5		.5
40 TRIE BOR E	50.0	0.3	.5		.5	
41 VACC VIT I	50.0	0.3		.5	.5	
42 VIOL REN I	50.0	0.3		.5	.5	
44 SCHI PUR P	25.0	0.5			02	
45 MITE NUD A	25.0	0.3				01
46 VIOL NEP H	25.0	0.3				01
47 CARE AEN E	25.0	0.1	.5			
48 CINN LAT I	25.0	0.1	.5			
49 DISP TRA C	25.0	0.1		.5		
50 DRYO SPI N	25.0	0.1	.5			
51 EPIL ANG U	25.0	0.1				.5
52 EQUI SCI R	25.0	0.1		.5		
53 EQUI SYL V	25.0	0.1			.5	
54 LYCO COM P	25.0	0.1	.5			
55 STRE AMP L	25.0	0.1	.5			
56 TARA OFF I	25.0	0.1	.5			
MOSS AND LICHEN LAYER						
57 HYLO SPL E	100.0	2.3	02	02	02	03
58 PLEU SCH R	100.0	1.3	03	01	.5	.5
59 CLAV LIG U	50.0	0.4	01			.5
60 PLAG DRU M	50.0	0.3			.5	.5
61 PTIL CRI S	50.0	0.3	.5			.5
62 BRAC POP U	25.0	0.1				.5
63 DICR POL Y	25.0	0.1				.5
64 DICR SCO P	25.0	0.1	.5			
65 POLY STR I	25.0	0.1	.5			

BOREAL MIXEDWOOD ECOREGION

BMW 6 - WS/EQUISETUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0080
NUMBER OF SPECIES PER PLOT	33.0		33
SPECIES	%P	MC	%C SV
TREE LAYER			
1 POPU TRE M	100.0	16.0	16
2 PICE GLA U	100.0	13.0	13
3 PICE MAR I	100.0	3.0	03
4 ABIE BAL S	100.0	1.0	01
5 POPU BAL S	100.0	0.5	.5
SHRUB LAYER			
ABIE BAL S	100.0	4.0	04
6 RUBU IDA E	100.0	3.0	03
7 ALNU RUG O	100.0	1.0	01
HERB AND DWARF SHRUB LAYER			
8 ASTE CIL I	100.0	20.0	20
9 EQUI ARV E	100.0	18.0	18
10 MERT PAN I	100.0	5.0	05
11 RUBU PUB E	100.0	4.0	04
12 FRAG VIR G	100.0	3.0	03
13 VIOL REN I	100.0	3.0	03
14 EQUI SYL V	100.0	2.0	02
15 AGRO REP E	100.0	1.0	01
16 ARAL NUD I	100.0	1.0	01
17 MITE NUD A	100.0	1.0	01
18 PETA PAL M	100.0	1.0	01
19 ACTE RUB R	100.0	0.5	.5
20 BROM CIL I	100.0	0.5	.5
21 CALA CAN A	100.0	0.5	.5
22 EPIL ANG U	100.0	0.5	.5
23 GALI BOR E	100.0	0.5	.5
24 GALI TRI F	100.0	0.5	.5
25 HERA LAN A	100.0	0.5	.5
26 OSMO LON G	100.0	0.5	.5
27 SCHI PUR P	100.0	0.5	.5
MOSS AND LICHEN LAYER			
28 BRAC POP U	100.0	4.0	04
29 PLAG DRU M	100.0	3.0	03
30 THUI REC O	100.0	1.0	01
31 CORA MAC U	100.0	0.5	.5
32 PLEU SCH R	100.0	0.5	.5

BOREAL MIXEDWOOD ECOREGION

BMW 7 - BF

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0088
NUMBER OF SPECIES PER PLOT	36.0		36
SPECIES	%P	MC	C SV
TREE LAYER			
1 ABIE BAL S	100.0	44.0	44
2 BETU PAP Y	100.0	6.0	06
SHRUB LAYER			
ABIE BAL S	100.0	2.0	02
3 ACER SPI C	100.0	0.5	.5
4 ALNU CRI S	100.0	0.5	.5
5 RIBE TRI S	100.0	0.5	.5
6 ROSA SPP .	100.0	0.5	.5
7 VIBU EDU L	100.0	0.5	.5
HERB AND DWARF SHRUB LAYER			
8 ARAL NUD I	100.0	1.0	01
9 CORN CAN A	100.0	1.0	01
10 MITE NUD A	100.0	1.0	01
11 RUBU PUB E	100.0	1.0	01
12 ACTE RUB R	100.0	0.5	.5
13 ASTE CIL I	100.0	0.5	.5
14 CALA CAN A	100.0	0.5	.5
15 CIRC ALP I	100.0	0.5	.5
16 DRYO SPI N	100.0	0.5	.5
17 EQUI SYL V	100.0	0.5	.5
18 GALI TRI F	100.0	0.5	.5
19 GYMN DRY O	100.0	0.5	.5
20 LINN BOR E	100.0	0.5	.5
21 LYCO ANN O	100.0	0.5	.5
22 MAIA CAN A	100.0	0.5	.5
23 MERT PAN I	100.0	0.5	.5
24 MONE UNI F	100.0	0.5	.5
25 PETA PAL M	100.0	0.5	.5
26 PYRO ASA R	100.0	0.5	.5
27 TRIE BOR E	100.0	0.5	.5
28 VIOL REN I	100.0	0.5	.5
MOSS AND LICHEN LAYER			
29 DREP UNC I	100.0	7.0	07
30 SPLA SPP .	100.0	7.0	07
31 BRAC POP U	100.0	1.0	01
32 HYLO SPL E	100.0	1.0	01
33 PELT POL Y	100.0	0.5	.5
34 PLEU SCH R	100.0	0.5	.5
35 PTIL CRI S	100.0	0.5	.5

BOREAL MIXEDWOOD ECOREGION

BMW 8 - BS/LEDUM/PLEUROZIUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0004	000 0008	000 0009	000 0021	000 0028	000 0078
NUMBER OF SPECIES PER PLOT	29.3		24	30	28	35	24	35
SPECIES	%P	MC	%C SV	%C SV	%C SV	%C SV	C SV	C SV
TREE LAYER								
1 PICE MAR I	100.0	21.3	30	20	18	25	25	10
SHRUB LAYER								
2 LEDU GRO E	100.0	8.3	03	03	08	.5	15	20
PICE MAR I	100.0	2.5	.5	.5	.5	.5	05	08
3 ALNU RUG O	83.3	2.3		08	03	.5	01	01
4 RIBE TRI S	50.0	0.3	.5		.5		.5	
5 VACC MYR T	50.0	0.3	.5	.5				.5
6 ABIE BAL S	33.3	0.3	.5					01
7 ALNU CRI S	33.3	0.2				.5		.5
8 SALI SPP .	33.3	0.2					.5	.5
9 LARI LAR I	16.7	0.2						01
10 BETU GLA N	16.7	0.1				.5		
11 CORN ALT E	16.7	0.1			.5			
12 RIBE HUD S	16.7	0.1						.5
13 SALI MYR T	16.7	0.1						.5
HERB AND DWARF SHRUB LAYER								
14 RUBU CHA M	100.0	1.8	.5	.5	01	01	01	07
15 OXYC QUA D	100.0	1.0	.5	.5	01	.5	.5	03
16 VACC VIT I	100.0	0.8	01	.5	01	.5	01	01
17 EQUI SCI R	83.3	0.7	02	.5		.5	.5	.5
18 SMIL TRI F	66.7	0.7	.5		02		.5	01
19 CORN CAN A	66.7	0.5	01	.5		01		.5
20 HABE OBT U	66.7	0.4		.5	.5	01	.5	
21 GEOC LIV I	66.7	0.3		.5	.5	.5	.5	
22 HABE ORB I	66.7	0.3	.5		.5	.5	.5	
23 CARE LEP T	50.0	2.8		10	01	06		
24 EQUI SYL V	50.0	0.8	02				02	01
25 ANDR GLA U	50.0	0.3			.5		.5	.5
26 EMPE NIG R	50.0	0.3			.5		.5	.5
27 MITE NUD I	50.0	0.3		.5	.5	.5		
28 CARE PAU P	33.3	1.3		03		05		
29 EQUI PRA T	33.3	0.7					03	01
30 CALA CAN A	33.3	0.5		02		01		
31 EQUI ARV E	33.3	0.4	02		.5			
32 RANU LAP P	33.3	0.3		01			.5	
33 CALT PAL U	33.3	0.2		.5		.5		
34 EPIL ANG U	33.3	0.2				.5		.5
35 EPIL PAL U	33.3	0.2		.5	.5			
36 EQUI FLU V	33.3	0.2		.5		.5		
37 HABE HYP E	33.3	0.2		.5	.5			
38 LIST BOR E	33.3	0.2		.5	.5			
39 PYRO SEC U	33.3	0.2		.5				.5
40 RUBU PUB E	33.3	0.2	.5			.5		
41 MENY TRI F	16.7	0.3		02				
42 CARE LEN T	16.7	0.2	01					
43 CARE LOL I	16.7	0.2					01	
44 MITE NUD A	16.7	0.2						01
45 PETA VIT I	16.7	0.2				01		
46 ARAL NUD I	16.7	0.1			.5			
47 CARE INT E	16.7	0.1	.5					
48 DESC CAE S	16.7	0.1						.5
49 FRAG VIR G	16.7	0.1						.5
50 GALI TRI F	16.7	0.1				.5		
51 LINN BOR E	16.7	0.1						.5
52 LUZU PAR V	16.7	0.1			.5			
53 PETA PAL M	16.7	0.1	.5					
54 POTE PAL U	16.7	0.1				.5		
55 STRE AMP L	16.7	0.1				.5		
56 TRIE BOR E	16.7	0.1				.5		
MOSS AND LICHEN LAYER								
57 HYLO SPL E	100.0	13.2	60	02	01	11	04	01
58 PLEU SCH R	100.0	67.0	30	70	94	60	90	58
59 PTIL CRI S	83.3	4.3	05	03	03	11	04	
60 SPHA NEM O	66.7	7.8	02	05	01			39
61 RHIZ PSE U	50.0	0.9		04		01		.5
62 POLY STR I	50.0	0.3	.5		.5	.5		
63 SPHA WAR N	33.3	4.2		10		15		
64 PELT APT H	33.3	0.2				.5		.5
66 CLAD RAN G	16.7	0.2						01
67 SPHA MAG E	16.7	0.2				01		
68 CLAD MIT I	16.7	0.1					.5	
69 DICR PUL Y	16.7	0.1						.5
70 PELT POL Y	16.7	0.1						.5

BOREAL MIXEDWOOD ECOREGION

BMW 9 - BS/LEDUM/SPHAGNUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0094
NUMBER OF SPECIES PER PLOT	30.0		30
SPECIES	%P	MC	%C SV
TREE LAYER			
1 PICE MAR I	100.0	12.0	12
SHRUB LAYER			
2 LEDU GRO E	100.0	18.0	18
PICE MAR I	100.0	3.0	03
3 ALNU RUG O	100.0	2.0	02
4 SALI SPP .	100.0	2.0	02
5 BETU GLA N	100.0	0.5	.5
6 RIBE HUD S	100.0	0.5	.5
7 VACC MYR T	100.0	0.5	.5
HERB AND DWARF SHRUB LAYER			
8 RUBU CHA M	100.0	20.0	20
9 OXYC QUA D	100.0	3.0	03
10 CALA CAN A	100.0	1.0	01
11 CARE DIS P	100.0	1.0	01
12 CORN CAN A	100.0	1.0	01
13 SMIL TRI F	100.0	1.0	01
14 VACC VIT I	100.0	1.0	01
15 ANDR GLA U	100.0	0.5	.5
16 CARE PAU P	100.0	0.5	.5
17 EPIL ANG U	100.0	0.5	.5
18 EQUI SCI R	100.0	0.5	.5
19 HABE ORB I	100.0	0.5	.5
20 PETA SAG G	100.0	0.5	.5
MOSS AND LICHEN LAYER			
21 PLEU SCH R	100.0	40.0	40
22 SPHA MAG E	100.0	31.0	31
23 SPHA FUS C	100.0	24.0	24
24 CALL RIC H	100.0	1.0	01
25 HYLO SPL E	100.0	1.0	01
26 POLY STR I	100.0	1.0	01
27 RHIZ PSE U	100.0	1.0	01
28 CLAD FUR C	100.0	0.5	.5
29 PTIL CRI S	100.0	0.5	.5

MID-BOREAL LOWLAND ECOREGION

MBL I - JP/HUDSONIA/LICHEN

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0012		000 0055		000 0081	
NUMBER OF SPECIES PER PLOT	14.7		16		11		17	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV
TREE LAYER								
1 PINU BAN K	33.3	3.0					09	
SHRUB LAYER								
PINU BAN K	66.7	6.7	10		10			
2 SALI SPP .	66.7	0.5	01				.5	
3 VACC MYR T	33.3	1.0	03					
4 VACC ANG U	33.3	0.7	02					
5 ALNU CRI S	33.3	0.2	.5					
6 AMEL ALN I	33.3	0.2			.5			
7 PRUN PEN S	33.3	0.2					.5	
8 PRUN VIR G	33.3	0.2			.5			
HERB AND DWARF SHRUB LAYER								
9 HUDS TOM E	100.0	30.7	12		50		30	
10 ARCT UVA U	66.7	0.7	01				01	
11 FEST SAX I	66.7	0.3	.5				.5	
12 SOLI DEC U	66.7	0.3	.5		.5			
13 SOLI HIS P	66.7	0.3	.5				.5	
15 ANDR SCO P	33.3	0.2					.5	
16 ARTE CAU D	33.3	0.2					.5	
17 CAMP ROT U	33.3	0.2	.5					
18 ERIG GLA B	33.3	0.2					.5	
19 KOEL CRI S	66.7	0.5			01		.5	
20 MAIA CAN A	33.3	0.2	.5					
21 SELA RUP E	33.3	0.2					.5	
MOSS AND LICHEN LAYER								
22 CLAD MIT I	100.0	15.3	20		01		25	
23 CLAD GRA C	100.0	6.3	03		01		15	
24 POLY JUN I	100.0	1.5	.5		02		02	
25 CLAD CRI S	100.0	0.5	.5		.5		.5	
26 CERA PUR P	66.7	1.3			03		01	

MID-BOREAL LOWLAND ECOREGION

MBL 2a - JP/AMELANCHIER/ARCTOSTAPHYLOS

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0040	000 0041	000 0043	000 0046	000 0047	000 0083	000 0087
NUMBER OF SPECIES PER PLOT	30.4		30	25	32	31	36	32	27
SPECIES	%P	MC	%C SV	%C SV	C SV	C SV	C SV	C SV	C SV
TREE LAYER									
1 PINU BAN K	85.7	16.0	15		25	20	30	13	13
2 ABIE BAL S	14.3	0.1							01
3 POPU TRE M	14.3	0.1				.5			
SHRUB LAYER									
4 ROSA SPP .	85.7	5.8	08		10	10	.5	02	10
5 VACC MYR T	85.7	1.9	03	01	03	05	.5		.5
6 AMEL ALN I	71.4	6.3	04	20	03	09			08
7 ALNU CRI S	71.4	2.1	01	.5	08	.5	05		
8 SHEP CAN A	71.4	0.5	01	.5	.5			01	.5
9 LONI DIO T	57.1	0.5		02		.5	.5	.5	
10 SYMP ALB U	71.4	4.0	08	10	04	05			01
11 PRUN PEN N	42.9	0.6	03	.5		01			
POPU TRE M	42.9	0.4	02			.5			.5
12 PRUN VIR G	42.9	0.4			02			.5	.5
PINU BAN K	28.6	1.8		12				.5	
14 SALI SPP .	28.6	0.3				01			01
15 CORY COR N	28.6	0.1			.5	.5			
16 RUBU IDA E	28.6	0.1				.5	.5		
17 SALI GLA U	14.3	0.7					05		
ABIE BAL S	14.3	0.1						.5	
18 CORN ALT E	14.3	0.1					.5		
19 CORN STO L	14.3	0.1						.5	
20 LEDU GRO E	14.3	0.1					01		
21 PICE GLA U	14.3	0.1						.5	
22 PICE MAR I	14.3	0.1						.5	
23 POTE FRU T	14.3	0.1					.5		
24 SALI BEB B	14.3	0.1	.5						
25 SPIR ALB A	14.3	0.1							.5
26 VIBU EDU L	14.3	0.1					.5		
HERB AND DWARF SHRUB LAYER									
27 MAIA CAN A	100.0	2.1	01	01	01	04	.5	04	03
28 GALI BOR E	100.0	0.7	.5	02	.5	.5	.5	.5	.5
29 LATH OCH R	85.7	0.4	.5	.5	.5	.5		.5	.5
30 ARCT UVA U	71.4	9.1		10	15	18		01	20
31 LINN BOR E	71.4	5.4	02		08	17	10	.5	
32 ELYM INN O	71.4	2.6	08	03	02	03			02
33 FRAG VIR G	71.4	2.1	04	02	05	.5	03		
34 ASTE LAE V	71.4	1.1	01	02		02		.5	02
35 ERIG GLA B	57.1	1.1	.5		03	03		01	
36 SCHI PUR P	57.1	1.1		02		05	.5	.5	
37 SOLI HIS P	57.1	0.4		.5	.5	.5		01	
38 ANEM QUI N	42.9	0.2	.5			.5	.5		
39 APOC AND R	42.9	0.2		.5	.5	.5			
40 CAMP ROT U	42.9	0.2	.5		.5	.5			
41 HIER CAN A	42.9	0.2	.5					.5	.5
42 CORN CAN A	28.6	2.6			08		10		
43 RUBU PUB E	28.6	1.4			02		08		
44 ASTE CIL I	28.6	0.7			04		01		
45 ARAL NUD I	28.6	0.4		02			.5		
46 AGRO SUB S	28.6	0.2						01	.5
47 EPIL ANG U	28.6	0.2			.5		01		
48 PETA PAL M	28.6	0.2			.5		01		
49 ANEM MUL T	28.6	0.1						.5	.5
50 CHIM UMB E	28.6	0.1	.5		.5				
51 GOOD REP E	28.6	0.1	.5				.5		
52 LILI PHI L	28.6	0.1			.5		.5		
53 SMIL STE L	28.6	0.1						.5	.5
54 VACC VIT I	14.3	0.4	03						
55 ARTE CAU D	14.3	0.1						.5	
56 CARE SPP .	14.3	0.1					.5		
57 DANT SPI C	14.3	0.1						01	
58 FEST SAX I	14.3	0.1						.5	
59 HEUC RIC H	14.3	0.1			.5				
60 KOEL CRI S	14.3	0.1						.5	
61 LYCO COM P	14.3	0.1		.5					
62 MITE NUD A	14.3	0.1					.5		
63 MUHL RAC E	14.3	0.1						01	
64 PREN ALB A	14.3	0.1		.5					
65 PYRO ASA R	14.3	0.1					.5		
66 PYRO SEC U	14.3	0.1	.5						
67 SANI MAR I	14.3	0.1					.5		
68 TARA OFF I	14.3	0.1			.5				
69 TRIE BOR E	14.3	0.1					.5		
MOSS AND LICHEN LAYER									
70 PLEU SCH R	100.0	18.4	79	05	05	25	01	01	11
71 CLAD MIT I	85.7	7.6	.5	.5	.5	.5		50	01
72 DICR POL Y	85.7	0.4	.5	.5	.5	.5	.5		.5
73 HYLO SPL E	57.1	1.6	.5			.5	02		08
74 BRAC PUP U	28.6	0.2		01			.5		
75 CLAD FUR C	14.3	0.3							02
76 CLAD RAN G	14.3	0.1						.5	
77 DICR FLA G	14.3	0.1					.5		
78 PELT APT H	14.3	0.1						.5	
79 POLY JUN I	14.3	0.1					.5		
80 PTIL CRI S	14.3	0.1	.5						
81 THUI ABI E	14.3	0.1							01

MID-BOREAL LOWLAND ECOREGION

MBL 2b - TA/AMELANCHIER/ARCTOSTAPHYLOS

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0017	000 0048	000 0082
NUMBER OF SPECIES PER PLOT	26.7		22	25	33
SPECIES	%P	MC	%C SV	%C SV	%C SV
TREE LAYER					
1 POPU TRE M	100.0	41.7	50	40	35
2 POPU BAL S	33.3	0.3			01
3 PINU BAN K	33.3	0.2			.5
SHRUB LAYER					
4 AMEL ALN I	100.0	9.3	01	17	10
5 VACC MYR T	100.0	7.5	15	.5	07
6 ROSA SPP .	100.0	6.7	05	10	05
POPU TRE M	100.0	2.3	01	04	02
7 SPIR ALB A	100.0	2.2	.5	05	01
8 ALNU CRI S	66.7	5.0	12		03
POPU BAL S	33.3	1.3			04
9 SALI SPP .	33.3	1.3			04
10 PRUN VIR G	33.3	1.0		03	
11 RUBU IDA E	33.3	0.7	02		
12 SALI BEB B	33.3	0.7	02		
13 BETU GLA N	33.3	0.3			01
15 SYMP ALB U	66.7	0.7		01	01
16 POTE FRU T	33.3	0.2			.5
HERB AND DWARF SHRUB LAYER					
17 MAIA CAN A	100.0	2.5	.5	04	03
18 ARCT UVA U	66.7	7.7		18	05
19 ARAL NUD I	66.7	4.0	10		02
20 AGRO SUB S	66.7	1.8		.5	05
21 ELYM INN O	66.7	1.3		01	03
22 RUBU PUB E	66.7	1.2	.5		03
23 CORN CAN A	66.7	0.8	02		.5
24 LATH OCH R	66.7	0.8		02	.5
25 ASTE CIL I	66.7	0.5	.5		01
26 HEUC RIC H	66.7	0.5		.5	01
27 CAMP ROT U	66.7	0.3		.5	.5
28 GALI BOR E	66.7	0.3		.5	.5
29 SOLI HIS P	100.0	0.5	.5	.5	.5
30 APOC AND R	33.3	1.3		04	
31 FRAG VIR G	33.3	1.3			04
32 SCHI PUR P	33.3	1.3		04	
33 ELYM CAN A	33.3	1.0			03
34 ASTE LAE V	33.3	0.7		02	
35 KOEL CRI S	33.3	0.3		01	
36 DISP TRA C	33.3	0.2	.5		
37 EPIL ANG U	33.3	0.2	.5		
38 EQUI HYM A	33.3	0.2		.5	
39 EQUI SYL V	33.3	0.2	.5		
40 ERIG GLA B	33.3	0.2		.5	
41 LILI PHI L	33.3	0.2			.5
42 LYCO ANN O	33.3	0.2	.5		
43 LYCO OBS C	33.3	0.2	.5		
44 PETA PAL M	33.3	0.2	.5		
45 PYRO ASA R	33.3	0.2			.5
47 THAL VEN U	33.3	0.2		.5	
48 TRIE BOR E	33.3	0.2	.5		
49 VICI AME R	33.3	0.2			.5
MOSS AND LICHEN LAYER					
50 BRAC POP U	66.7	0.3		.5	.5

MID-BOREAL LOWLAND ECOREGION

MBL 3 - JP/LEDUM/LINNAEA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0049	000 0050	000 0051
NUMBER OF SPECIES PER PLOT	29.0		31	30	26
SPECIES	%P	MC	%C SV	%C SV	C SV
SHRUB LAYER					
1 PINU BAN K	100.0	18.3	10	20	25
2 POTE FRU T	100.0	13.3	25	10	05
3 LEDU GRO E	100.0	8.5	15	10	.5
4 BETU GLA N	100.0	8.3	20	03	02
5 CORN ALT E	66.7	5.2	15	.5	
6 LONI VIL L	66.7	4.0	10	02	
7 PICE MAR I	66.7	2.5	07		.5
8 ALNU CRI S	66.7	2.3		04	03
9 AMEL ALN I	66.7	0.5	.5	01	
10 ROSA SPP .	66.7	0.5	.5	01	
11 SALI SPP .	66.7	0.5	.5	01	
12 BETU PAP Y	33.3	0.2			.5
13 LONI DIO I	33.3	0.2		.5	
14 POPU TRE M	33.3	0.2			.5
15 SHEP CAN A	33.3	0.2		.5	
16 VACC MYR T	33.3	0.2		.5	
HERB AND DWARF SHRUB LAYER					
17 LINN BOR E	100.0	34.0	40	55	07
18 FRAG VIR G	100.0	2.7	01	04	03
19 ASTE CIL I	100.0	1.7	01	01	03
20 GALI BOR E	100.0	0.7	.5	01	.5
21 MAIA CAN A	100.0	0.7	.5	01	.5
22 CARE SCI R	66.7	2.7	04	04	
23 RUBU PUB E	66.7	2.0	02	04	
24 ARCT UVA U	66.7	1.2		.5	03
25 SOLI HIS P	66.7	1.2	.5		03
26 DESC CAE S	66.7	1.0	02	01	
27 BOTR VIR G	66.7	0.3	.5	.5	
28 EQUI SCI R	66.7	0.3		.5	.5
29 LILI PHI L	66.7	0.3		.5	.5
30 PETA PAL M	66.7	0.3	.5	.5	
31 CALA CAN A	33.3	1.0			03
32 MUHL RAC E	33.3	1.0			03
33 ANDR GLA U	33.3	0.3	01		
34 CORN CAN A	33.3	0.3		01	
35 JUNI HOR I	33.3	0.3	01		
36 AGRO SUB S	33.3	0.2			.5
37 ANEM QUI N	33.3	0.2		.5	
38 CAMP ROT U	33.3	0.2			.5
39 EPIL ANG U	33.3	0.2			.5
40 EPIL PAL U	33.3	0.2		.5	
41 GENT CRI N	33.3	0.2			.5
42 PARN MUL T	33.3	0.2	.5		
43 SPIR LAC E	33.3	0.2			.5
44 TOFI GLU T	33.3	0.2	.5		
45 VACC VIT I	33.3	0.2	.5		
46 ZYGA ELE G	33.3	0.2			.5
MOSS AND LICHEN LAYER					
47 PLEU SCH R	66.7	3.2	09	.5	
48 CLAD MIT I	66.7	0.3	.5		.5
49 DICR POL Y	33.3	0.3	01		
50 AULA PAL U	33.3	0.2	.5		
51 CAMP STE L	33.3	0.2	.5		

MID-BOREAL LOWLAND ECOREGION

MBL 4 - JP/VACCINIUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0013	000 0016	000 0052	000 0053
NUMBER OF SPECIES PER PLOT	15.3		15	19	13	14
SPECIES	%P	MC	%C SV	%C SV	%C SV	%C SV
TREE LAYER						
1 PINU BAN K	25.0	3.8			15	
2 POPU TRE M	25.0	0.1		.5		
SHRUB LAYER						
3 VACC MYR T	100.0	10.3	30	05	05	01
PINU BAN K	75.0	16.3	20	30		15
4 ALNU CRI S	75.0	10.1	15	25		.5
5 PICE MAR I	75.0	3.1	02		.5	10
6 LEDU GRO E	75.0	2.4	04	.5		05
7 VACC CAE S	50.0	6.3		15	10	
8 CHAM CAL Y	50.0	0.4	01	.5		
POPU TRE M	50.0	0.4	01	.5		
9 SALI SPP .	50.0	0.4		01	.5	
10 VACC ANG U	25.0	0.8				03
11 SPIR ALB A	25.0	0.1		.5		
HERB AND DWARF SHRUB LAYER						
12 EPIL ANG U	100.0	1.0	.5	01	.5	02
13 EQUI SYL V	75.0	0.9	.5	01		02
14 MAIA CAN A	50.0	0.4		.5		01
15 ARCT UVA U	25.0	0.3			01	
16 DANT SPI C	25.0	0.3			01	
17 RUBU PUB E	25.0	0.3		01		
18 AGRO SCA B	25.0	0.1			.5	
19 CAMP ROT U	25.0	0.1		.5		
20 CORN CAN A	25.0	0.1				.5
21 FEST SAX I	25.0	0.1		.5		
22 LYCO ANN O	25.0	0.1		.5		
23 LYCO OBS C	25.0	0.1	.5			
24 SOLI HIS P	25.0	0.1			.5	
MOSS AND LICHEN LAYER						
25 CLAD GRA C	75.0	6.1	.5		20	04
26 POLY JUN I	75.0	4.8		02	15	02
27 CLAD MIT I	50.0	2.5			08	02
28 PLEU SCH R	50.0	0.9	03			.5
29 CLAD FUR C	50.0	0.4	.5	01		
30 POLY COM M	25.0	0.3	01			
31 CLAV LIG U	25.0	0.1	.5			

MID-BOREAL LOWLAND ECOREGION

MBL 5a - POPULUS/CORYLUS/ARALIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0037	000 0038	000 0062	000 0067	000 0068	000 0070
NUMBER OF SPECIES PER PLOT	43.3		44	40	59	36	34	47
SPECIES	%P	MC	%C SV	%C SV	%C SV	%C SV	%C SV	%C SV
TREE LAYER								
1 POPU TRE M	100.0	17.8	06	18	15	18	25	25
2 POPU BAL S	66.7	3.5	12	02		02		05
3 BETU PAP Y	66.7	2.7	05	01	08			02
4 PICE GLA U	33.3	0.7	01		03			
5 PINU BAN K	16.7	0.8			05			
6 PICE MAR I	16.7	0.7			04			
SHRUB LAYER								
7 CORY COR N	100.0	13.8	03	02	.5	05	70	02
8 ROSA SPP .	100.0	4.2	01	10	05	02	04	03
9 CORN STO L	100.0	3.8	07	02	01	02	01	10
10 PRUN VIR G	100.0	2.8	03	01	.5	05	07	.5
11 SYMP ALB U	100.0	1.9	02	01	01	.5	01	06
POPU TRE M	100.0	1.1	02	01	.5	.5	02	.5
12 AMEL ALN I	83.3	1.6	.5	02		04	02	01
13 VIBU EDU L	83.3	1.4	.5	01	02	03		02
14 ACER SPI C	66.7	4.6	25		01	01		.5
PICE GLA U	66.7	1.3		.5	04	03		.5
15 ALNU CRI S	50.0	9.3	30		01	25		
16 RUBU IDA E	50.0	0.4		.5	01		01	
17 SALI SPP .	50.0	0.3	.5				.5	.5
18 ALNU RUG O	33.3	5.2	06					25
19 DIER LON I	33.3	1.2			02		05	
20 VIBU TRI L	33.3	0.3	01		.5			
BETU PAP Y	33.3	0.2	.5	.5				
21 RIBE HIR T	33.3	0.2			.5			.5
22 PRUN PEN S	16.7	0.7	04					
23 ABIE BAL S	16.7	0.5			03			
PICE MAR I	16.7	0.3			02			
24 SALI BEB B	16.7	0.3		02				
25 CORN ALT E	16.7	0.2			01			
26 FRAX PEN N	16.7	0.2	01					
27 LONI DIO I	16.7	0.1	.5					
28 LONI VIL L	16.7	0.1						.5
POPU BAL S	16.7	0.1			.5			
29 RIBE TRI S	16.7	0.1			.5			
30 SHEP CAN A	16.7	0.1					.5	
31 SORB DEC O	16.7	0.1			.5			
HERB AND DWARF SHRUB LAYER								
32 ASTE CIL I	100.0	3.3	02	04	05	04	01	04
33 PYRO ASA R	100.0	1.2	02	01	01	01	01	01
34 MAIA CAN A	100.0	1.0	01	01	02	.5	.5	01
35 PETA PAL M	100.0	1.0	.5	.5	02	01	01	01
36 GALI BOR E	100.0	0.6	.5	.5	.5	01	.5	.5
37 ARAL NUD I	83.3	18.0		25	30	30	08	15
38 RUBU PUB E	100.0	9.5	10	04	08	15	02	18
39 FRAG VIR G	83.3	4.3		02	08	05	03	08
40 CORN CAN A	83.3	3.0	03		03	05	03	04
41 LINN BOR E	83.3	2.0	01	02	03	01		05
42 BROM CIL I	83.3	1.0		.5	02	01	.5	02
43 VIOL REN I	83.3	0.8	.5		01	02	.5	.5
44 LATH OCH R	83.3	0.7		01	.5	01	01	.5
45 SANI MAR I	83.3	0.5		.5	.5	01	.5	.5
46 DISP TRA C	83.3	0.4	.5	.5		.5	.5	.5
47 MITE NUD A	66.7	2.7	02		10	02		02
48 MERT PAN I	66.7	0.8	01	02	01			01
49 GALI TRI F	66.7	0.4	01		.5	.5		.5
50 PYRO SEC U	66.7	0.4		01	.5	.5	.5	
51 ELYM INN O	66.7	0.3		.5	.5	.5	.5	
52 ACTE RUB R	50.0	0.3			.5		.5	.5
53 EQUI SCI R	50.0	0.3			.5	.5		.5
54 SMIL STE L	50.0	0.3	.5			.5		.5
55 CALA CAN A	33.3	0.3		01	01			
56 CINN LAT I	33.3	0.3			01		.5	
57 EPIL ANG U	33.3	0.3	.5	01				
58 EQUI ARV E	33.3	0.3	.5		01			
59 ANEM QUI N	33.3	0.2					.5	.5
60 BOTR VIR G	33.3	0.2			.5			.5
61 LYSI CIL I	33.3	0.2					.5	.5
62 SOLI HIS P	33.3	0.2	.5	.5				
63 TARA OFF I	33.3	0.2		.5		.5		
64 TRIE BOR E	33.3	0.2	.5					.5
66 LYCO ANN O	16.7	0.5			03			
67 ACHI SIB I	16.7	0.1						.5
68 ANEM RIP A	16.7	0.1						.5
69 APOC AND R	16.7	0.1		.5				
70 EQUI PRA T	16.7	0.1						.5
71 HABE ORB I	16.7	0.1			.5			
72 LILI PHI L	16.7	0.1						.5
73 MONO UNI F	16.7	0.1		.5				
74 SMIL RAC E	16.7	0.1			.5			
75 STRE AMP L	16.7	0.1			.5			
76 THAL VEN U	16.7	0.1	.5					
77 VICI AME R	33.3	0.2		.5				.5
MOSS AND LICHEN LAYER								
79 BRAC POP U	83.3	0.4	.5	.5	.5	.5	.5	
80 HYLO SPL E	50.0	1.3	01	.5	06			
81 PLEU SCH R	33.3	0.8	.5		04			
82 AULA PAL U	16.7	0.1	.5					
83 BRAC RUT A	16.7	0.1			.5			
84 PLAG DRU M	16.7	0.1					.5	
85 PTIL CRI S	16.7	0.1			.5			

MID-BOREAL LOWLAND ECOREGION

MBL 5b - WB/CORYLUS/ARALIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0042	000 0066	000 0069
NUMBER OF SPECIES PER PLOT	37.7		35	39	39
SPECIES	%P	MC	%C SV	%C SV	%C SV
TREE LAYER					
1 BETU PAP Y	100.0	24.0	12	50	10
2 PINU BAN K	66.7	1.3	02	02	
4 LARI LAR I	33.3	6.7			20
5 POPU TRE M	33.3	5.0	15		
SHRUB LAYER					
6 CORY COR N	100.0	4.2	08	.5	04
7 ACER SPI C	100.0	2.0	01	01	04
8 ROSA SPP .	100.0	0.8	01	01	.5
9 DIER LON I	66.7	13.3	15	25	
BETU PAP Y	66.7	5.0	10		05
10 CORN STO L	66.7	4.3	10		03
11 ALNU CRI S	66.7	2.7	04	04	
12 ALNU RUG O	66.7	2.0		03	03
13 VIBU EDU L	66.7	1.3	02	02	
14 RUBU IDA E	66.7	1.2	03		.5
15 PICE MAR I	66.7	1.0		01	02
POPU TRE M	66.7	0.5	01	.5	
16 PRUN VIR G	66.7	0.5	.5	01	
17 VACC MYR T	66.7	0.5	01		.5
18 SYMP ALB U	66.7	0.3	.5	.5	
19 VIBU TRI L	66.7	0.3	.5		.5
20 CORN ALT E	33.3	1.3			04
21 PICE GLA U	33.3	0.7		02	
22 LEDU GRO E	33.3	0.3			01
23 ABIE BAL S	33.3	0.2		.5	
24 AMEL ALN I	33.3	0.2	.5		
25 CHAM CAL Y	33.3	0.2			.5
26 RIBE HIR T	33.3	0.2			.5
27 RIBE OXY C	33.3	0.2	.5		
28 SALI SPP .	33.3	0.2		.5	
HERB AND DWARF SHRUB LAYER					
29 RUBU PUB E	100.0	15.0	05	15	25
30 CORN CAN A	100.0	2.7	02	04	02
31 TRIE BOR E	100.0	0.5	.5	.5	.5
32 ARAL NUD I	66.7	7.3	02	20	
33 LINN BOR E	66.7	2.8	.5		08
34 MITE NUD A	66.7	2.3		04	03
35 LYCO ANN O	66.7	1.7		03	02
36 ASTE CIL I	66.7	1.0	01	02	
37 BROM CIL I	66.7	0.7		01	01
38 ELYM INN O	66.7	0.5	01	.5	
39 GALI BOR E	66.7	0.5	.5	01	
40 MAIA CAN A	66.7	0.5	01	.5	
41 GALI TRI F	66.7	0.3		.5	.5
42 CARE LEP T	33.3	1.7			05
43 FRAG VIR G	33.3	1.7		05	
44 EQUI PRA T	33.3	0.7			02
45 VACC VIT I	33.3	0.7			02
46 AGRO TRA C	33.3	0.3			01
47 CINN LAT I	33.3	0.3		01	
48 MATT STR U	33.3	0.3		01	
49 MERT PAN I	33.3	0.3		01	
50 PETA PAL M	33.3	0.3		01	
51 APOC AND R	33.3	0.2	.5		
52 ASTE PUN I	33.3	0.2			.5
53 ATHY FIL I	33.3	0.2		.5	
54 COPT TRI F	33.3	0.2			.5
55 CORA MAC U	33.3	0.2	.5		
56 EQUI SYL V	33.3	0.2		.5	
57 LATH OCH R	33.3	0.2	.5		
58 OXYC QUA D	33.3	0.2			.5
59 PYRO ASA R	33.3	0.2	.5		
60 PYRO SEC U	33.3	0.2	.5		
61 SANI MAR I	33.3	0.2		.5	
62 VIOL NEP H	33.3	0.2			.5
63 VIOL REN I	33.3	0.2		.5	
MOSS AND LICHEN LAYER					
64 BRAC POP U	66.7	0.3	.5	.5	
65 SPHA WAR N	33.3	4.3			13
66 SPHA NEM O	33.3	1.7			05
67 CLIM DEN D	33.3	1.0			03
68 HYLO SPL E	33.3	1.0			03
69 AULA PAL U	33.3	0.2			.5
70 CALL COR D	33.3	0.2			.5
71 DICR POL Y	33.3	0.2			.5
72 PLAG DRU M	33.3	0.2	.5		
73 PLEU SCH R	33.3	0.2		.5	

MID-BOREAL LOWLAND ECOREGION

MBL 5c - JP/CORYLUS/ARALIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0065	
NUMBER OF SPECIES PER PLOT	41.0		41	
SPECIES	%P	MC	%C	SV
TREE LAYER				
1 PINU BAN K	100.0	10.0	10	
2 BETU PAP Y	100.0	8.0	08	
SHRUB LAYER				
3 DIER LON I	100.0	50.0	50	
4 PRUN VIR G	100.0	4.0	04	
5 RUBU IDA E	100.0	4.0	04	
6 CORN STO L	100.0	2.0	02	
7 CORY COR N	100.0	2.0	02	
8 VIBU EDU L	100.0	2.0	02	
9 AMEL ALN I	100.0	1.0	01	
10 PICE GLA U	100.0	1.0	01	
11 POPU BAL S	100.0	1.0	01	
12 ROSA SPP .	100.0	1.0	01	
13 ABIE BAL S	100.0	0.5	.5	
14 ACER SPI C	100.0	0.5	.5	
15 PICE MAR I	100.0	0.5	.5	
16 POPU TRE M	100.0	0.5	.5	
17 SORB DEC O	100.0	0.5	.5	
HERB AND DWARF SHRUB LAYER				
18 ARAL NUD I	100.0	18.0	18	
19 RUBU PUB E	100.0	5.0	05	
20 ELYM INN O	100.0	4.0	04	
21 FRAG VIR G	100.0	4.0	04	
22 CORN CAN A	100.0	3.0	03	
23 LATH OCH R	100.0	2.0	02	
24 EPIL ANG U	100.0	1.0	01	
25 GALI BOR E	100.0	1.0	01	
26 LINN BOR E	100.0	1.0	01	
27 MERT PAN I	100.0	1.0	01	
28 PETA PAL M	100.0	1.0	01	
29 ACTE RUB R	100.0	0.5	.5	
30 APOC AND R	100.0	0.5	.5	
31 ASTE CIL I	100.0	0.5	.5	
32 DISP TRA C	100.0	0.5	.5	
33 GALI TRI F	100.0	0.5	.5	
34 HIER CAN A	100.0	0.5	.5	
35 MAIA CAN A	100.0	0.5	.5	
36 SYMP ALB U	100.0	0.5	.5	
37 TRIE BOR E	100.0	0.5	.5	
38 VICI AME R	100.0	0.5	.5	
MOSS AND LICHEN LAYER				
39 PLEU SCH R	100.0	1.0	01	
40 BRAC POP U	100.0	0.5	.5	
41 DICR POL Y	100.0	0.5	.5	

MID-BOREAL LOWLAND ECOREGION

MBL 6 - TA/ACER

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0057		000 0086	
NUMBER OF SPECIES PER PLOT	31.0		30		32	
SPECIES	%P	MC	%C	SV	%C	SV
TREE LAYER						
1 POPU TRE M	100.0	22.5	20		25	
2 ABIE BAL S	50.0	4.0	08			
3 BETU PAP Y	50.0	3.0	06			
SHRUB LAYER						
4 ACER SPI C	100.0	51.5	68		35	
5 CORY COR N	100.0	14.0	03		25	
6 SYMP ALB U	100.0	0.8	.5		01	
7 VIBU EDU L	100.0	0.8	01		.5	
8 CORN STO L	50.0	1.0			02	
9 DIER LON I	50.0	1.0	02			
10 PRUN PEN S	50.0	1.0			02	
11 VIBU TRI L	50.0	1.0			02	
12 LONI DIO I	50.0	0.5			01	
POPU TRE M	50.0	0.5			01	
13 RUBU IDA E	50.0	0.5			01	
ABIE BAL S	50.0	0.3	.5			
14 PRUN VIR G	50.0	0.3	.5			
15 RIBE HIR T	50.0	0.3	.5			
16 RIBE TRI S	50.0	0.3	.5			
17 ROSA SPP .	50.0	0.3			.5	
HERB AND DWARF SHRUB LAYER						
18 RUBU PUB E	100.0	2.5	01		04	
19 ARAL NUD I	100.0	2.0	01		03	
20 VIOL REN I	100.0	1.5	02		01	
21 ASTE CIL I	100.0	0.8	.5		01	
22 MATT STR U	100.0	0.8	.5		01	
23 GALI TRI F	100.0	0.5	.5		.5	
24 MERT PAN I	100.0	0.5	.5		.5	
25 PETA PAL M	100.0	0.5	.5		.5	
26 PYRO ASA R	100.0	0.5	.5		.5	
27 TRIE BOR E	100.0	0.5	.5		.5	
28 MITE NUD A	50.0	2.5	05			
29 CORN CAN A	50.0	1.5	03			
30 FRAG VIR G	50.0	0.5			01	
31 ANEM QUI N	50.0	0.3	.5			
32 CORA MAC U	50.0	0.3	.5			
33 ELYM INN O	50.0	0.3			.5	
34 GALI BOR E	50.0	0.3			.5	
35 LATH OCH R	50.0	0.3			.5	
36 MAIA CAN A	50.0	0.3			.5	
37 OSMO CHI L	50.0	0.3	.5			
38 PYRO SEC U	50.0	0.3			.5	
39 SANI MAR I	50.0	0.3			.5	
40 STRE AMP L	50.0	0.3	.5			
41 VICI AME R	50.0	0.3			.5	
MOSS AND LICHEN LAYER						
42 BRAC PLU M	50.0	0.5			01	
43 BRAC POP U	50.0	0.5	01			
44 EURY PUL C	50.0	0.3			.5	
45 PLAG DRU M	50.0	0.3	.5			

MID-BOREAL LOWLAND ECOREGION

MBL 7 - PICEA/CORNUS STOLONIFERA

PRESENCE (P), MEAN COVER (MC), PERCENT COVER (C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0039	
NUMBER OF SPECIES PER PLOT	41.0		41	
SPECIES	P	MC	C	SV
TREE LAYER				
1 PICE MAR I	100.0	7.0	07	
2 PICE GLA U	100.0	6.0	06	
3 POPU TRE M	100.0	5.0	05	
4 POPU BAL S	100.0	4.0	04	
SHRUB LAYER				
PICE MAR I	100.0	13.0	13	
5 CORN STO L	100.0	10.0	10	
6 ROSA SPP .	100.0	3.0	03	
PICE GLA U	100.0	1.0	01	
7 SALI SPP .	100.0	1.0	01	
8 SHEP CAN A	100.0	1.0	01	
9 VIBU EDU L	100.0	1.0	01	
10 ABIE BAL S	100.0	0.5	.5	
11 ACER SPI C	100.0	0.5	.5	
12 AMEL ALN I	100.0	0.5	.5	
13 BETU PAP Y	100.0	0.5	.5	
14 CORN ALT E	100.0	0.5	.5	
15 CORY COR N	100.0	0.5	.5	
16 LEDU GRO E	100.0	0.5	.5	
17 POTE FRU T	100.0	0.5	.5	
18 SALI LAN A	100.0	0.5	.5	
19 SYMP ALB U	100.0	0.5	.5	
20 VIBU TRI L	100.0	0.5	.5	
HERB AND DWARF SHRUB LAYER				
21 RUBU PUB E	100.0	9.0	09	
22 ASTE CIL I	100.0	5.0	05	
23 FRAG VIR G	100.0	5.0	05	
24 VACC VIT I	100.0	3.0	03	
25 ARAL NUD I	100.0	2.0	02	
26 CORN CAN A	100.0	2.0	02	
27 LINN BOR E	100.0	2.0	02	
28 MERT PAN I	100.0	2.0	02	
29 PETA PAL M	100.0	2.0	02	
30 CALA CAN A	100.0	1.0	01	
31 MAIA CAN A	100.0	1.0	01	
32 ACTE RUB R	100.0	0.5	.5	
33 EQUI SCI R	100.0	0.5	.5	
34 GALI BOR E	100.0	0.5	.5	
35 THAL VEN U	100.0	0.5	.5	
MOSS AND LICHEN LAYER				
36 HYLO SPL E	100.0	1.0	01	
37 AULA PAL U	100.0	0.5	.5	
38 BRAC POP U	100.0	0.5	.5	
39 PLEU SCH R	100.0	0.5	.5	

MID-BOREAL LOWLAND ECOREGION

MBL 8a - BPO/ACER/MATTEUCIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0060		000 0085	
NUMBER OF SPECIES PER PLOT	31.5		41		22	
SPECIES	%P	MC	%C	SV	%C	SV
TREE LAYER						
1 POPU BAL S	100.0	17.0	18		16	
2 BETU PAP Y	50.0	7.0	14			
3 ACER NEG U	50.0	0.5			01	
SHRUB LAYER						
4 ACER SPI C	100.0	67.5	60		75	
5 CORY COR N	100.0	1.3	.5		02	
6 RIBE TRI S	100.0	1.3	02		.5	
7 VIBU TRI L	100.0	0.8	.5		01	
8 CORN STO L	50.0	0.5			01	
9 POPU TRE M	50.0	0.5			01	
10 PRUN PEN S	50.0	0.5			01	
POPU BAL S	50.0	0.3	.5			
11 PRUN VIR G	50.0	0.3	.5			
12 RIBE HIR T	50.0	0.3	.5			
13 SALI SPP .	50.0	0.3	.5			
14 SYMP ALB U	50.0	0.3	.5			
HERB AND DWARF SHRUB LAYER						
15 MATT STR U	100.0	6.0	02		10	
16 CARE SPP .	100.0	5.5	10		01	
17 RUBU PUB E	100.0	4.5	07		02	
18 ASTE CIL I	100.0	1.3	02		.5	
19 MERT PAN I	100.0	1.3	02		.5	
20 MAIA CAN A	100.0	1.0	01		01	
21 VIOL REN I	100.0	1.0	01		01	
22 GALI TRI F	100.0	0.8	01		.5	
23 GALI BOR E	100.0	0.5	.5		.5	
24 THAL VEN U	100.0	0.5	.5		.5	
25 MITE NUD A	50.0	5.0	10			
26 ATHY FIL I	50.0	3.0	06			
27 ARAL NUD I	50.0	0.5	01			
28 EQUI ARV E	50.0	0.5	01			
29 FRAG VIR G	50.0	0.5	01			
30 ACTE RUB R	50.0	0.3	.5			
31 ANEM QUI N	50.0	0.3	.5			
32 BROM CIL I	50.0	0.3	.5			
33 CINN LAT I	50.0	0.3	.5			
34 CIRC ALP I	50.0	0.3	.5			
35 CORA MAC U	50.0	0.3	.5			
36 ELYM INN O	50.0	0.3	.5			
37 EQUI PRA T	50.0	0.3	.5			
38 EQUI SCI R	50.0	0.3			.5	
39 PETA PAL M	50.0	0.3			.5	
40 PYRO ASA R	50.0	0.3	.5			
41 SANI MAR I	50.0	0.3	.5			
42 THAL DAS Y	50.0	0.3			.5	
43 TRIE BOR E	50.0	0.3	.5			
MOSS AND LICHEN LAYER						
44 BRAC POP U	50.0	0.3	.5			
45 EURY PUL C	50.0	0.3	.5			
46 PLAG DRU M	50.0	0.3	.5			
47 RHIZ PSE U	50.0	0.3	.5			

MID-BOREAL LOWLAND ECOREGION

MBL 8b - WB/ACER/MATTEUCIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0059	000 0061
NUMBER OF SPECIES PER PLOT	29.0		28	30
SPECIES	%P	MC	%C SV	%C SV
TREE LAYER				
1 BETU PAP Y	100.0	30.0	25	35
2 POPU TRE M	50.0	2.5		05
3 ABIE BAL S	50.0	1.5	03	
4 POPU BAL S	50.0	1.5	03	
SHRUB LAYER				
5 ACER SPI C	100.0	57.5	50	65
6 CORY COR N	100.0	2.3	.5	04
ABIE BAL S	100.0	0.8	01	.5
7 DIER LON I	50.0	0.3	.5	
POPU TRE M	50.0	0.3	.5	
8 PRUN VIR G	50.0	0.3		.5
9 RIBE TRI S	50.0	0.3	.5	
10 VIBU TRI L	50.0	0.3		.5
HERB AND DWARF SHRUB LAYER				
11 VIOL REN I	100.0	2.8	.5	05
12 ASTE CIL I	100.0	1.5	01	02
13 ARAL NUD I	100.0	1.3	.5	02
14 CORN CAN A	100.0	0.8	01	.5
15 GALI TRI F	100.0	0.8	.5	01
16 MERT PAN I	100.0	0.8	01	.5
17 ACTE RUB R	100.0	0.5	.5	.5
18 ANEM QUI N	100.0	0.5	.5	.5
19 DISP TRA C	100.0	0.5	.5	.5
20 CARE SPP .	50.0	1.5		03
21 MATT STR U	50.0	1.5		03
22 MITE NUD A	50.0	1.0	02	
23 RUBU PUB E	100.0	1.5	02	01
24 BROM CIL I	50.0	0.5		01
25 ELYM INN O	50.0	0.5		01
26 FRAG VIR G	50.0	0.5		01
27 GALI BOR E	50.0	0.5		01
29 THAL DAS Y	50.0	0.5		01
30 CINN LAT I	50.0	0.3		.5
31 EQUI SCI R	50.0	0.3	.5	
32 OSMO CHI L	50.0	0.3		.5
33 PYRO ASA R	50.0	0.3		.5
34 SANI MAR I	50.0	0.3		.5
35 TRIE BOR E	50.0	0.3		.5
MOSS AND LICHEN LAYER				
36 BRAC POP U	100.0	2.3	04	.5
37 EURY PUL C	50.0	5.0	10	
38 HYLO SPL E	50.0	0.5	01	
39 DICR POL Y	50.0	0.3	.5	
40 PELT POL Y	50.0	0.3	.5	
41 PLAG DRU M	50.0	0.3	.5	
42 PTIL CRI S	50.0	0.3	.5	

MID-BOREAL LOWLAND ECOREGION

MBL 8c - WE/ACER/MATTEUCIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0084
NUMBER OF SPECIES PER PLOT	38.0		38
SPECIES	P	MC	%C SV
TREE LAYER			
1 ULMU AME R	100.0	15.0	15
2 POPU TRE M	100.0	8.0	08
3 ACER NEG U	100.0	3.0	03
4 FRAX PEN N	100.0	3.0	03
5 POPU BAL S	100.0	3.0	03
SHRUB LAYER			
6 VIBU TRI L	100.0	15.0	15
FRAX PEN N	100.0	6.0	06
7 CORY COR N	100.0	5.0	05
8 PRUN VIR G	100.0	4.0	04
9 CORN STO L	100.0	3.0	03
ACER NEG U	100.0	2.0	02
10 ACER SPI C	100.0	2.0	02
11 AMEL ALN I	100.0	1.0	01
POPU TRE M	100.0	1.0	01
POPU BAL S	100.0	0.5	.5
12 RIBE TRI S	100.0	0.5	.5
13 SYMP ALB U	100.0	0.5	.5
ULMU AME R	100.0	0.5	.5
HERB AND DWARF SHRUB LAYER			
14 MATT STR U	100.0	12.0	12
15 ASTE CIL I	100.0	5.0	05
16 CARE SPP .	100.0	3.0	03
17 RUBU PUB E	100.0	3.0	03
18 EQUI PRA T	100.0	2.0	02
19 ARAL NUD I	100.0	1.0	01
20 DISP TRA C	100.0	1.0	01
21 FRAG VIR G	100.0	1.0	01
22 MAIA CAN A	100.0	1.0	01
23 THAL DAS Y	100.0	1.0	01
24 ACTE RUB R	100.0	0.5	.5
25 AGRO SCA B	100.0	0.5	.5
26 AGRO SUB S	100.0	0.5	.5
27 ANEM QUI N	100.0	0.5	.5
28 ELYM CAN A	100.0	0.5	.5
29 GALI TRI F	100.0	0.5	.5
30 PETA PAL M	100.0	0.5	.5
31 PYRO ASA R	100.0	0.5	.5
32 SANI MAR I	100.0	0.5	.5
33 VIOL REN I	100.0	0.5	.5

MID-BOREAL LOWLAND ECOREGION

MBL 9 - BF

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0056		000 0058	
NUMBER OF SPECIES PER PLOT	19.0		17		21	
SPECIES	%P	MC	%C	SV	%C	SV
TREE LAYER						
1 ABIE BAL S	100.0	41.5	53		30	
2 BETU PAP Y	100.0	4.5	07		02	
3 POPU TRE M	50.0	11.5			23	
SHRUB LAYER						
4 ACER SPI C	100.0	1.5	02		01	
ABIE BAL S	100.0	0.8	01		.5	
BETU PAP Y	50.0	0.3	.5			
5 DIER LON I	50.0	0.3			.5	
6 RIBE TRI S	50.0	0.3			.5	
7 VIBU EDU L	50.0	0.3			.5	
HERB AND DWARF SHRUB LAYER						
8 MITE NUD A	100.0	1.5	02		01	
9 ARAL NUD I	100.0	1.3	.5		02	
10 CORN CAN A	100.0	0.8	.5		01	
11 TRIE BOR E	100.0	0.5	.5		.5	
12 VIOL REN I	100.0	0.5	.5		.5	
13 ANEM QUI N	50.0	0.3	.5			
14 GALI TRI F	50.0	0.3	.5			
15 LYCO ANN O	50.0	0.3			.5	
16 MAIA CAN A	50.0	0.3			.5	
17 MERT PAN I	50.0	0.3			.5	
18 PETA PAL M	50.0	0.3	.5			
19 RUBU PUB E	50.0	0.3			.5	
MOSS AND LICHEN LAYER						
20 PELT POL Y	100.0	0.5	.5		.5	
21 EURY PUL C	50.0	1.0			02	
22 HYLO SPL E	50.0	1.0	02			
23 BRAC POP U	50.0	0.5			01	
24 CLAV LIG U	50.0	0.3	.5			
25 PLAG DRU M	50.0	0.3			.5	
26 PTIL CRI S	50.0	0.3	.5			

MID-BOREAL LOWLAND ECOREGION

MBL 10 - WS/HYLOCOMIUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0071	
NUMBER OF SPECIES PER PLOT	37.0		37	
SPECIES	%P	MC	%C	SV
TREE LAYER				
1 PICE GLA U	100.0	13.0	13	
2 PICE MAR I	100.0	9.0	09	
3 POPU BAL S	100.0	2.0	02	
SHRUB LAYER				
4 CORN STO L	100.0	3.0	03	
PICE GLA U	100.0	2.0	02	
PICE MAR I	100.0	1.0	01	
5 ROSA SPP .	100.0	1.0	01	
6 ALNU RUG O	100.0	0.5	.5	
7 BETU PAP Y	100.0	0.5	.5	
8 CORY COR N	100.0	0.5	.5	
9 LEDU GRO E	100.0	0.5	.5	
10 LONI VIL L	100.0	0.5	.5	
11 POTE FRU T	100.0	0.5	.5	
12 SHEP CAN A	100.0	0.5	.5	
13 SYMP ALB U	100.0	0.5	.5	
HERB AND DWARF SHRUB LAYER				
14 RUBU PUB E	100.0	12.0	12	
15 CORN CAN A	100.0	5.0	05	
16 LINN BOR E	100.0	4.0	04	
17 PETA PAL M	100.0	4.0	04	
18 CARE VAG I	100.0	3.0	03	
19 FRAG VIR G	100.0	3.0	03	
20 ASTE CIL I	100.0	2.0	02	
21 SMIL STE L	100.0	1.0	01	
22 ANEM RIP A	100.0	0.5	.5	
23 EQUI SCI R	100.0	0.5	.5	
24 GALI BOR E	100.0	0.5	.5	
25 LILI PHI L	100.0	0.5	.5	
26 LYSI CIL I	100.0	0.5	.5	
27 MONO UNI F	100.0	0.5	.5	
28 PYRO ASA R	100.0	0.5	.5	
29 PYRO SEC U	100.0	0.5	.5	
30 SANI MAR I	100.0	0.5	.5	
31 SOLI HIS P	100.0	0.5	.5	
32 TARA OFF I	100.0	0.5	.5	
MOSS AND LICHEN LAYER				
33 HYLO SPL E	100.0	40.0	40	
34 PLEU SCH R	100.0	1.0	01	
35 BRAC POP U	100.0	0.5	.5	

MID-BOREAL LOWLAND ECOREGION

MBL 11 - BS/LEDUM/SPHAGNUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0014	000 0015	000 0054
NUMBER OF SPECIES PER PLOT	22.0		21	17	28
SPECIES	%P	MC	%C SV	%C SV	%C SV
TREE LAYER					
1 LARI LAR I	66.7	2.3	02		05
SHRUB LAYER					
2 PICE MAR I	100.0	18.0	13	11	30
3 LEDU GRO E	100.0	15.7	20	07	20
LARI LAR I	100.0	3.2	.5	08	01
4 BETU GLA N	66.7	0.5	.5		01
5 SALI SPP .	66.7	0.5	.5	01	
6 ALNU CRI S	66.7	0.3	.5		.5
7 SALI MAC C	33.3	0.3			01
HERB AND DWARF SHRUB LAYER					
8 EQUI FLU V	100.0	0.7	.5	01	.5
9 VACC VIT I	66.7	3.7	03		08
10 CARE PAU P	66.7	2.3	04		03
11 ANDR GLA U	66.7	1.3	01	03	
12 OXYC QUA D	66.7	1.0	01	02	
13 POTE PAL U	66.7	0.5	.5		01
14 CARE BRU N	33.3	3.3		10	
15 MENY TRI F	33.3	3.3		10	
16 CALA CAN A	33.3	1.0			03
17 PETA SAG G	33.3	0.7			02
18 SMIL TRI F	33.3	0.7	02		
19 CARE INT E	33.3	0.3		01	
20 CARE LEP T	33.3	0.3			01
21 EQUI PRA T	33.3	0.3			01
22 EQUI SYL V	33.3	0.3			01
23 SARR PUR P	33.3	0.3		01	
24 PYRO SEC U	33.3	0.2	.5		
MOSS AND LICHEN LAYER					
25 SPHA NEM O	100.0	32.7	08	63	27
26 PLEU SCH R	100.0	23.0	47	17	05
27 SPHA MAG E	100.0	20.7	40	17	05
28 POLY STR I	66.7	1.0	01		02
29 AULA PAL U	66.7	0.7		01	01
30 CLAD RAN G	66.7	0.5	01	.5	
31 SPHA FUS C	33.3	8.3			25
32 SPHA WAR N	33.3	8.3			25
33 DICR POL Y	33.3	0.3			01
34 PELT CAN I	33.3	0.3	01		
35 CLAD GRA C	33.3	0.2			.5
36 CLAD MIT I	33.3	0.2			.5
37 HYLO SPL E	33.3	0.2			.5
38 PELT APT H	33.3	0.2			.5
39 TOME NIT E	33.3	0.2		.5	

MID-BOREAL LOWLAND ECOREGION

MBL 12 - JP/PLEUROZIUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0044		000 0063		000 0064	
NUMBER OF SPECIES PER PLOT	39.7		37		45		37	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV
TREE LAYER								
1 PINU BAN K	100.0	19.0	22		15		20	
2 PICE MAR I	66.7	1.3	03				01	
3 POPU TRE M	33.3	1.0	03					
4 BETU PAP Y	33.3	0.3			01			
5 PICE GLA U	33.3	0.3					01	
6 POPU BAL S	33.3	0.3			01			
SHRUB LAYER								
7 ALNU CRI S	100.0	11.0	06		07		20	
8 ROSA SPP .	100.0	4.3	06		02		05	
BETU PAP Y	100.0	2.7	02		04		02	
9 VIBU EDU L	100.0	1.7	01		02		02	
PICE MAR I	100.0	1.5	.5		01		03	
10 CORY COR N	100.0	1.2	02		01		.5	
11 ABIE BAL S	66.7	1.7			04		01	
12 DIER LON I	66.7	1.0	01		02			
POPU TRE M	66.7	0.5	01				.5	
13 ALNU RUG O	33.3	1.0			03			
15 RUBU IDA E	33.3	1.0			03			
PICE GLA U	33.3	0.7			02			
16 SORB DEC O	33.3	0.3					01	
17 ACER SPI C	33.3	0.2			.5			
18 AMEL ALN I	33.3	0.2					.5	
19 CORN STO L	33.3	0.2	.5					
20 LEDU GRO E	33.3	0.2	.5					
21 PRUN VIR G	33.3	0.2	.5					
22 RIBE HIR T	33.3	0.2			.5			
23 RIBE TRI S	33.3	0.2			.5			
24 VIBU TRI L	33.3	0.2			.5			
HERB AND DWARF SHRUB LAYER								
25 RUBU PUB E	100.0	12.7	03		20		15	
26 CORN CAN A	100.0	7.0	08		03		10	
27 ARAL NUD I	100.0	6.3	01		15		03	
28 LYCO ANN O	100.0	5.8	.5		05		12	
ELYM INN O	100.0	5.7	04		03		10	
29 LINN BOR E	100.0	5.7	08		05		04	
30 FRAG VIR G	100.0	3.3	03		03		04	
31 ASTE CIL I	100.0	1.5	.5		02		02	
32 PETA PAL M	100.0	1.3	01		01		02	
33 MAIA CAN A	100.0	0.8	01		.5		01	
34 GALI BOR E	100.0	0.5	.5		.5		.5	
35 MERT PAN I	66.7	1.3			02		02	
36 MITE NUD A	66.7	0.7			01		01	
37 PYRO SEC U	66.7	0.5	.5				01	
38 ANEM QUI N	66.7	0.3	.5		.5			
39 EPIL ANG U	66.7	0.3			.5		.5	
40 TRIE BOR E	66.7	0.3			.5		.5	
41 CINN LAT I	33.3	0.7			02			
42 CALA CAN A	33.3	0.3					01	
43 EQUI ARV E	33.3	0.3			01			
44 PYRO ASA R	33.3	0.3			01			
45 VIOL REN I	33.3	0.3			01			
46 BOTR VIR G	33.3	0.2			.5			
47 CORA MAC U	33.3	0.2					.5	
48 GALI TRI F	66.7	0.3			.5		.5	
50 GROC LIV I	33.3	0.2	.5					
51 GOOD REP E	33.3	0.2	.5					
52 HIER CAN A	33.3	0.2	.5					
53 LATH OCH R	33.3	0.2					.5	
54 LYCO COM P	33.3	0.2	.5					
55 OSMO CHI L	33.3	0.2					.5	
56 VIOL PAU P	33.3	0.2	.5					
MOSS AND LICHEN LAYER								
57 PLEU SCH R	100.0	66.0	67		50		81	
58 HYLO SPL E	100.0	15.0	20		20		05	
59 PTIL CRI S	100.0	3.2	.5		05		04	
60 DICR POL Y	33.3	1.0	03					
61 BRAC RUT A	33.3	0.2			.5			
62 CLAV LIG U	33.3	0.2	.5					

MID-BOREAL LOWLAND ECOREGION

MBL 13 - BS/PLEUROZIUM-HYLOCOMIUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		000 0045	
NUMBER OF SPECIES PER PLOT	18.0		18	
SPECIES	%P	MC	%C	SV
TREE LAYER				
1 PINU BAN K	100.0	20.0	20	
2 PICE MAR I	100.0	12.0	12	
SHRUB LAYER				
3 ABIE BAL S	100.0	1.0	01	
4 VACC MYR T	100.0	1.0	01	
5 CORN STO L	100.0	0.5	.5	
PICE MAR I	100.0	0.5	.5	
HERB AND DWARF SHRUB LAYER				
6 LINN BOR E	100.0	3.0	03	
7 PETA PAL M	100.0	2.0	02	
8 CARE SPP .	100.0	1.0	01	
9 MAIA CAN A	100.0	1.0	01	
10 CALA CAN A	100.0	0.5	.5	
11 GOOD REP E	100.0	0.5	.5	
12 PYRO ASA R	100.0	0.5	.5	
13 PYRO SEC U	100.0	0.5	.5	
MOSS AND LICHEN LAYER				
14 HYLO SPL E	100.0	34.0	34	
15 PLEU SCH R	100.0	33.0	33	
16 PTIL CRI S	100.0	30.0	30	
17 CLAV LIG U	100.0	0.5	.5	

APPENDIX III

SITE DATA

SITE DESCRIPTION SUMMARY

ECOREGION: **BOREAL MIXEDWOOD**

FOREST ECOSYSTEM: **BMW 1 - TA/Corylus/Aralia - Waitville**

	PLOTS				
VARIABLE	18	22	MODAL	MEAN	RANGE
Elevation (m)	739	800		770	739-800
Landform	Mh-r	Mh-r	Mh-r		
% Slope	43	25		34	25-43
Aspect	S	S	S		
Site Position:					
Macro	mid	up	var.		
Meso	mid	up	var.		
Soil Subgroup	O.EB	BR.GL	-		
Soil Series	WTV	WTV	WTV		
Moist Regime (1-9)	4	5		5	4-5
Nutrient Regime (1-6)	2	2		2	-
Soil Drainage (1-6)	2	2		2	-
Humus:					
Form	R.Mod	F.Mor			
Depth (cm)	9	11		10	9-11
Solum Depth (cm)	40	35		38	35-40
Texture:					
A Horizon	-	-	-		
B Horizon	L.CL	SCL.SL	-		
C Horizon	SCL	SL	-		
Coarse Fragments:					
A Horizon	-	-		-	-
B Horizon	25	10		18	10-25
C Horizon	20	15		18	15-20
Family Particle Size	FL	CL	FL		
Soil pH:					
LFH or Organic				-	-
A or Organic				-	-
B or Organic				-	-
C or Organic				-	-
Tree Species:	WS	TA			
DBH (mm)					
Height (m)	13.00	14.8			
Vol (cu.m/ha)					
Age (yr)	25	81			
S.I.	23.7	11.1		17.4	11.1-23.7
M.A.I. (cu.m/ha)	1.91	1.09		1.50	1.09-1.91

SITE DESCRIPTION SUMMARY

ECOREGION: BOREAL MIXEDWOOD

FOREST ECOSYSTEM: BMW 2 - JP/Lycopodium/Pleurozium - Waitville

	PLOTS									
VARIABLE	1	27	31	89	96	97	99	MODAL	MEAN	RANGE
Elevation (m)	732	721	747	680	720	718	709		718	680-747
Landform	Mu	Mh	Mh	Mh	Mh	Mh	Fu	Mh		
% Slope	2	4	12	9	3	9	5		6	2-12
Aspect	SE	N	S	NW	-	-	SE	var.		
Site Position:										
Macro	Valley	up	up	up	up	mid	mid	var		
Meso	up	up	up	up	up	mid	mid	var.		
Soil Subgroup	O.GL	O.GL	O.GL	E.EB	O.GL	O.GL	G.E.EB	O.GL		
Soil Series	WTV	WTV	DKM	RKH	WTV	WTV	TEK	WTV		
Moist Regime (1-9)	5	5	5	4	5	5	6		5	4-6
Nutrient Regime (1-6)	3	3	3	2	2	3	4		3	2-4
Soil Drainage (1-6)	3	2	2	2	2	2	4		2	2-4
Humus:										
Form	Mod	F.Mor	F.Mor	F.Mor-Mull	F.Mor	F.Mor	F.Mor	F.Mor		
Depth (cm)	6	9	12	6	10	9	9		9	6-12
Solum Depth (cm)	30	60	45	120	70	50	45		60	30-120
Texture:										
A Horizon	SL	SL	FSL	FSL	SL	SL	SL	-		
B Horizon	CL.C	CL	SiC	FSL	CL	C	SL	-		
C Horizon	CL.SCL	CL	SiC	L	CL	CL	L	-		
Coarse Fragments:										
A Horizon	-	-	-	-	-	-	-	-	-	-
B Horizon	7	-	-	-	-	-	-	-	7	-
C Horizon	7	2	2	2	-	-	10	-	3	2-7
Family Particle Size	FL	FL	FL	L	FL	FL	L	FL		
Soil pH:										
LFH or Organic				-	-	-	-		-	-
A or Organic				4.5	5.5	5.0	4.0		4.8	4.0-5.5
B or Organic				5.5	-	5.0	5.0		5.2	5.0-5.5
C or Organic				-	-	-	-		-	-
Tree Species:	JP	JP	JP	JP	JP	JP	JP		JP	
DBH (mm)										
Height (m)	20.1	19.2	18.2	21.5	22.0	20.5	22.1		20.5	18.2-22.1
Vol (cu.m/ha)										
Age (yr)	84	72	87	92	89	93	81		85	72-93
S.I.	15.2	15.7	13.3	15.7	16.3	14.7	17.2		15.4	13.3-17.2
M.A.I. (cu.m/ha)	2.42	5.08	4.10	4.59	5.91	3.64	4.27		4.28	2.42-5.91

SITE DESCRIPTION SUMMARY

ECOREGION: **BOREAL MIXEDWOOD**

FOREST ECOSYSTEM: **BMW 3 - BS/Pleurozium - Hylocomium - Breckon**

	PLOTS					
VARIABLE	77	95	98	MODAL	MEAN	RANGE
Elevation (m)	732	729	709		723	709-732
Landform	Mr	Ll	Ml-u	var.		
% Slope	7	0	2		3	0-7
Aspect	NE	level	SW	var.		
Site Position:						
Macro	up	plain	valley	var.		
Meso	up	level	level	var		
Soil Subgroup	O.LG	G.GL	O.HG	-		
Soil Series	SNT	VRL	BKO	-		
Moist Regime (1-9)	7	5	7		6	5-7
Nutrient Regime (1-6)	4	4	5		4	4-5
Soil Drainage (1-6)	5	4	5		5	4-5
Humus:						
Form	Anmor	F.Mor-Mull	H.Fib	-		
Depth (cm)	6	9	13		9	6-13
Solum Depth (cm)	40	45	25		37	25-45
Texture:						
A Horizon	SL	SiL	SiL	-		
B Horizon	CL	C	SiCL	-		
C Horizon	CL	C	SiCL	-		
Coarse Fragments:						
A Horizon	-	-	-		-	-
B Horizon	-	-	5		5	-
C Horizon	-	-	5		5	-
Family Particle Size	FL	C	FL	FL		
Soil pH:						
LFH or Organic	4.7	-	6.0		5.4	4.7-6.0
A or Organic	4.8	-	7.0		5.9	4.8-7.0
B or Organic	5.7	-	7.0		6.4	5.7-7.0
C or Organic	7.7	-	-		7.7	-
Tree Species:	BS	BS	BS		BS	
DBH (mm)						
Height (m)	12.7	18.4	21.3		17.5	12.7-21.3
Vol (cu.m/ha)						
Age (yr)	79	76	87		81	76-87
S.I.	9.0	14.0	15.2		12.7	10.0-15.2
M.A.I. (cu.m/ha)	2.44	3.50	4.98		3.64	2.44-4.98

SITE DESCRIPTION SUMMARY

ECOREGION: **BOREAL MIXEDWOOD**

FOREST ECOSYSTEM: **BMW 4 - WS/Hylocomium - Verrall Lake**

VARIABLE	PLOTS 10	29	79	100	MODAL	MEAN	RANGE
Elevation (m)	787	720	730	720		739	720-787
Landform	Mh	Fv/L	Lh	Ll-u	var.		
% Slope	9	8	35	3		14	3-35
Aspect	W	NW	NE	NW	NW		
Site Position:							
Macro	mid	mid	low	mid	mid		
Meso	mid	mid	mid	mid	mid		
Soil Subgroup	O.GL	O.GL	D.GL	O.GL	O.GL		
Soil Series	WTV	VRL	BCS	VRL	VRL		
Moist Regime (1-9)	5	5	5	6		5	5-6
Nutrient Regime (1-6)	2	3	4	4		3	2-4
Soil Drainage (1-6)	1	3	2	3		2	1-3
Humus:							
Form	F.Mor	F.Mor	H.Fib	H.Fib			
Depth (cm)	12	8	12	14		12	8-14
Solum Depth (cm)	56	35	50	50		48	35-56
Texture:							
A Horizon	SL	SL	SiCL	SiL	-		
B Horizon	GSL	SL,SCL	SiC	C	-		
C Horizon	GSL	SiC	-	C	-		
Coarse Fragments:							
A Horizon	2	2				2	-
B Horizon	15	10				13	10-15
C Horizon	20	-				20	-
Family Particle Size	gvFS	C	C	C	C		
Soil pH:							
LFH or Organic	5.3	-	-	-		5.3	-
A or Organic	4.7	-	-	5.5		5.1	4.7-5.5
B or Organic	4.8	-	-	6.0		5.4	4.8-6.0
C or Organic	7.7	-	-	-		7.7	-
Tree Species:	WS	BS	WS	WS		WS	
DBH (mm)							
Height (m)	24.8	19.3	25.3	26.6		25.6	24.8-26.6
Vol (cu.m/ha)							
Age (yr)	89	90	84	82		85	82-90
S.I.	16.2	13.2	17.4	18.8		17.4	16.2-18.8
M.A.I. (cu.m/ha)	5.74	2.77	3.73	4.68		4.23	2.77-5.74

SITE DESCRIPTION SUMMARY

ECOREGION: **BOREAL MIXEDWOOD**

FOREST ECOSYSTEM: **BMW 5a - WS/Viburnum/Aralia - Waitville (Duck Mountain)**

	PLOTS										
VARIABLE	6	36	72	73	74	75	76	91	MODAL	MEAN	RANGE
Elevation (m)	732	742	655	681	684	771	774	764		725	655-774
Landform	Mh	Mh	Mh	Mh	Mh	Mh	Mh	Mh	Mh		
% Slope	7	1	5	9	10	25	15	20		12	1-25
Aspect	NE	NE	E	NE	NE	NE	E	S	NE		
Site Position:											
Macro	mid	mid	low	mid	up	up	face	low	var.		
Meso	mid	level	mid	up	low	low	mid	mid	var.		
Soil Subgroup	O.GL	B.GL	D.GL	O.GL	O.GL	O.GL	O.GL	O.GL	O.GL		
Soil Series	DKM	WTV	VRL	WTV	WTV	WTV	WTV	WTV	WTV		
Moist Regime (1-9)	5	5	6	5	5	5	4	5		5	4-6
Nutrient Regime (1-6)	4	4	5	3	3	3	2	3		3	2-5
Soil Drainage (1-6)	2	2	3	3	3	2	2	3		3	2-3
Humus:											
Form	F.Mor	F.Mor	H.Fib F.Hum	F.Mor	F.Mor	F.Mor	F.Mor	F.Mor	F.Mor		
Depth (cm)	10	10	17	9	9	6	7	11		10	7-17
Solum Depth (cm)	45	60	50	60	60	60	60	65		58	45-65
Texture:											
A Horizon	SiL	SL	SiL	FSL	FSL	LS.SL	LS	FSL			
B Horizon	SiC	CL	SiC	CL.C	C	L	L	C			
C Horizon	CL	CL	SiC	CL.C	CL	-	-	CL			
Coarse Fragments:											
A Horizon	-	5	-	-	-	-	-	-		5	-
B Horizon	5	5	5	7	5	2	50	2		10	2-50
C Horizon	2	5	5	10	7	-	-	2		5	2-10
Family Particle Size	FL	FL	C	FL	FL	L	L	FL	FL		
Soil pH:											
LFH or Organic	4.3	5.5	-	-	-	-	-	-		4.9	4.3-5.5
A or Organic	5.6	4.7	6.7	-	-	-	-	4.5		5.7	4.7-6.7
B or Organic	6.2	4.8	-	-	-	-	-	-		5.5	4.8-6.2
C or Organic	7.8	7.0	-	-	-	-	-	-		7.4	7.0-7.8
Tree Species:	WS	WS	WS	WS	WS	WS	WS	WS		WS	WS
DBH (mm)											
Height (m)	21.7	27.5	22.7	21.9	24.8	24.3	24.4	22.3		23.7	21.7-27.5
Vol (cu.m/ha)											
Age (yr)	69	83	77	80	85	78	81	87		80	69-87
S.I.	16.9	19.4	16.3	15.1	16.8	17.5	17.1	14.4		16.7	14.4-19.4
M.A.I. (cu.m/ha)	2.58	4.93	5.78	4.68	4.12	4.26	4.00	4.51		4.35	2.58-5.78

SITE DESCRIPTION SUMMARY

ECOREGION: BOREAL MIXEDWOOD

FOREST ECOSYSTEM: BMW 5b - TA/Viburnum/Aralia - Waitville (Duck Mountain)

	PLOTS								
VARIABLE	2	3	5	19	25	26	MODAL	MEAN	RANGE
Elevation (m)	730	732	723	739	724	724		729	723-732
Landform	Mu	Fv/L/M	Mu	Mh-r	Lv/Mu	Lv/Mu-m	var.		
% Slope	4	3	3	2	2	3		3	2-4
Aspect	S	E	NW	S	level	W	var.		
Site Position:									
Macro	up	mid	up	valley	up	low	var.		
Meso	mid	mid	up	mid	up	mid	var.		
Soil Subgroup	O.GL	O.GL	O.GL	GL.GL	O.GL	H.LG	O.GL		
Soil Series	DKM	DKM	WTV	SGU	DKM	BKO	DKM		
Moist Regime (1-9)	5	5	5	5	5	6		5	5-6
Nutrient Regime (1-6)	4	3	3	4	3	4		4	3-4
Soil Drainage (1-6)	2	2	3	3	3	3		2	2-3
Humus:									
Form	H.Fib	F.Mor	F.Mor	F.Mor	F.Mor	F.Mor	F.Mor		
Depth (cm)	14	11	7	13	12	12		12	7-14
Solum Depth (cm)	45	60	50	54	50	60		53	45-60
Texture:									
A Horizon	SiL	SL	FSL	SL	SiL	SiCL	-		
B Horizon	CL.C	CL	CL.C	CL	C	C	CL.C		
C Horizon	SCL	SiC	CL	-	CL	C	-		
Coarse Fragments:									
A Horizon	-		-	-	-			-	-
B Horizon	-		-	5	-			5	-
C Horizon	2		10	-	2			5	2-10
Family Particle Size	FC/FL	FC	FL	FC	FL	C	FL		
Soil pH:									
LFH or Organic					4.7			4.7	
A or Organic					4.3			4.3	
B or Organic					4.1			4.1	
C or Organic					7.3			7.3	
Tree Species:	BS	TA	-	WS	BPO	TA			
DBH (mm)									
Height (m)	15.3	21.2		23.3	20.3	22.4			
Vol (cu.m/ha)									
Age (yr)	74	80		91	85	78			
S.I.	11.6	16.5		14.7	15.3	17.8		15.2	11.6-17.8
M.A.I. (cu.m/ha)	1.94	2.16	2.08	3.61	2.29	2.10		2.36	1.94-3.61

SITE DESCRIPTION SUMMARY

ECOREGION: **BOREAL MIXEDWOOD**

FOREST ECOSYSTEM: **BMW 5c - BPO/Viburnum/Aralia - Waitville (Duck Mountain)**

	PLOTS			
VARIABLE	90	MODAL	MEAN	RANGE
Elevation (m)	692		692	-
Landform	Mh	Mh		
% Slope	9		9	-
Aspect	E	E		
Site Position:				
Macro	mid	mid		
Meso	up	up		
Soil Subgroup	O.GL	O.GL		
Soil Series	WTV	WTV		
Moist Regime (1-9)	5		5	-
Nutrient Regime (1-6)	3		3	-
Soil Drainage (1-6)	2		2	-
Humus:				
Form	H.Fib	H.Fib		
Depth (cm)	14		14	-
Solum Depth (cm)	55		55	-
Texture:				
A Horizon	FSL	FSL		
B Horizon	C	C		
C Horizon	CL	CL		
Coarse Fragments:				
A Horizon	-		-	-
B Horizon	-		-	-
C Horizon	5		5	-
Family Particle Size	FL	FL		
Soil pH:				
LFH or Organic				
A or Organic				
B or Organic				
C or Organic				
Tree Species:	BPO		BPO	
DBH (mm)				
Height (m)	21.1		21.1	-
Vol (cu.m/ha)				
Age (yr)	107		107	-
S.I.	14.5		14.5	-
M.A.I. (cu.m/ha)	3.13		3.13	-

SITE DESCRIPTION SUMMARY

ECOREGION: **BOREAL MIXEDWOOD**

FOREST ECOSYSTEM: **BMW 5d - WB/Viburnum/Aralia - Waitville (Duck Mountain)**

VARIABLE	PLOTS 7	 20	 23	 32	 33	 34	 92	 93	MODAL	MEAN	RANGE
Elevation (m)	777	739	793	758	755	747	758	759		761	739-793
Landform	Mu	Mh-r	Mh	Lh	Lv/Mh	Mh	Mh	Mh	Mh		
% Slope	3	25	0	20	9	12	0	35		13	0-35
Aspect	E	N	level	NW	NW	E	level	NW	var.		
Site Position:											
Macro	mid	mid	plain	mid	mid	mid	up	up	var.		
Meso	low	mid	low	mid	mid	mid	up	up	var.		
Soil Subgroup	D.GL	O.GL	O.GL	O.GL	O.GL	O.GL	O.GL	O.GL	O.GL		
Soil Series	WTV	WTV	WTV	BCS	DKM	DKM	WTV	WTV	WTV		
Moist Regime (1-9)	5	5	5	5	5	5	5	5		5	-
Nutrient Regime (1-6)	3	3	3	4	3	4	3	3		3	3-4
Soil Drainage (1-6)	2	2	2	3	3	3	2	2		2	2-3
Humus:											
Form	F.Mor	F.Mor	F.Mor	F.Mor	F.Mor	F.Mor	F.Mor	F.Mor	F.Mor		
Depth (cm)	10	8	14	11	11	11	12	11		11	8-14
Solum Depth (cm)	50	44	45	56	45	50	40	67		50	40-67
Texture:											
A Horizon	FSL	SL	SiL	SiCL	SiCL	SL	FSL	FSL	-		
B Horizon	CL.C	CL	CL	SiC	SiC	CL.C	C	C	-		
C Horizon	CL.C	CL	-	C	CL.C	SiC	CL	CL	CL		
Coarse Fragments:											
A Horizon	-		-		-	-	-			-	-
B Horizon	-		10		-	-	-			10	-
C Horizon	15		-		2	2	5			6	2-15
Family Particle Size	C	FL	FL	C	FL	C	FL	FL	FL		
Soil pH:											
LFH or Organic						5.4				5.4	-
A or Organic						4.8				4.8	-
B or Organic						5.6				5.6	-
C or Organic						6.9				6.9	-
Tree Species:	WS	BS	TA	WB	BS	BS	TA	WB			
DBH (mm)											
Height (m)	24.3	17.3	19.0	19.7	19.1	17.7	19.0	18.4			
Vol (cu.m/ha)											
Age (yr)	88	88	65	96	84	79	76	85			
S.I.	15.9	11.7	16.4	14.0	13.7	13.0	15.1	13.8		14.2	11.7-15.9
M.A.I. (cu.m/ha)	2.35	3.68	5.88	3.34	3.99	3.51	4.16	3.28		3.77	2.35-5.88

SITE DESCRIPTION SUMMARY

ECOREGION: **BOREAL MIXEDWOOD**

FOREST ECOSYSTEM: **BMW 5e - BS/Viburnum/Aralia - Waitville (Duck Mountain)**

	PLOTS						
VARIABLE	11	24	30	35	MODAL	MEAN	RANGE
Elevation (m)	777	771	729	755		758	729-777
Landform	Mh	Lv/Mh-i	Lh-m	Mh	var.		
% Slope	3	15	2	22		11	2-22
Aspect	SW	S	level	SE	S		
Site Position:							
Macro	up	low	plain	up	var.		
Meso	low	mid	level	low	var.		
Soil Subgroup	O.GL	GL.GL	O.GL	O.GL	O.GL		
Soil Series	WTV	SGU	BCS	WTV	WTV		
Moist Regime (1-9)	5	5	5	5		5	-
Nutrient Regime (1-6)	3	4	4	3		4	3-4
Soil Drainage (1-6)	2	4	3	2		3	2-4
Humus:							
Form	F.Mor	F.Mor	F.Mor	F.Mor	F.Mor		
Depth (cm)	11	11	13	7		11	7-13
Solum Depth (cm)	60	45	50	35		48	35-60
Texture:							
A Horizon	SL	SL	SiCL	SL	SL		
B Horizon	CL,C	SiC	SiC	CL,C	-		
C Horizon	CL	-	-	CL,C	-		
Coarse Fragments:							
A Horizon	-	-		-		-	-
B Horizon	10	5		15		10	5-15
C Horizon	15	-		5		10	5-15
Family Particle Size	FL	C	FC	FL	FL-C		
Soil pH:							
LFH or Organic				6.2		6.2	-
A or Organic				-		-	-
B or Organic				5.0		5.0	-
C or Organic				7.9		7.9	-
Tree Species:	JP	BS	BS	WS			
DBH (mm)							
Height (m)	19.2	18.4	20.1	21.7			
Vol (cu.m/ha)							
Age (yr)	89	80	84	84			
S.I.	14.0	13.5	14.5	14.3		14.7	13.5-14.5
M.A.I. (cu.m/ha)	4.62	3.27	4.37	3.95		4.05	3.27-4.62

SITE DESCRIPTION SUMMARY

ECOREGION: **BOREAL MIXEDWOOD**

FOREST ECOSYSTEM: **BMW 6 - WS/Equisetum - Rackham**

	PLOTS			
VARIABLE	80	MODAL	MEAN	RANGE
Elevation (m)	732		732	-
Landform	F-Lh	F-Lh		
% Slope	3		3	-
Aspect	NE	NE		
Site Position:				
Macro	up	up		
Meso	up	up		
Soil Subgroup	O.GL	O.GL		
Soil Series	RKH	RKH		
Moist Regime (1-9)	6		6	-
Nutrient Regime (1-6)	5		5	-
Soil Drainage (1-6)	4		4	-
Humus:				
Form	H.Fib	H.Fib		
Depth (cm)	10		10	-
Solum Depth (cm)	70		70	-
Texture:				
A Horizon	SL	SL		
B Horizon	L	L		
C Horizon	LS.SL	LS.SL		
Coarse Fragments:				
A Horizon				
B Horizon				
C Horizon				
Family Particle Size	FS	FS		
Soil pH:				
LFH or Organic	-		-	-
A or Organic	5.0		5.0	-
B or Organic	-		-	-
C or Organic	-		-	-
Tree Species:	WS		WS	
DBH (mm)				
Height (m)	22.7		22.7	
Vol (cu.m/ha)				
Age (yr)	76		76	
S.I.	16.4		16.4	-
M.A.I. (cu.m/ha)	6.47		6.47	-

SITE DESCRIPTION SUMMARY

ECOREGION: BOREAL MIXEDWOOD

FOREST ECOSYSTEM: BMW 7 - BF - Singush

	PLOTS			
VARIABLE	88	MODAL	MEAN	RANGE
Elevation (m)	648		648	-
Landform	Lv/Mu	Lv/Mu		
% Slope	5		5	-
Aspect	E	E		
Site Position:				
Macro	mid	mid		
Meso	mid	mid		
Soil Subgroup	D.GL	D.GL		
Soil Series	SGU	SGU		
Moist Regime (1-9)	5		5	-
Nutrient Regime (1-6)	4		4	-
Soil Drainage (1-6)	3		3	-
Humus:				
Form	F.Mor-H.Fib	-		
Depth (cm)	12		12	-
Solum Depth (cm)	60		60	-
Texture:				
A Horizon	SiL	SiL		
B Horizon	SiC	SiC		
C Horizon	CL	CL		
Coarse Fragments:				
A Horizon	-		-	-
B Horizon	-		-	-
C Horizon	2		2	-
Family Particle Size	FL	FL		
Soil pH:				
LFH or Organic				
A or Organic				
B or Organic				
C or Organic				
Tree Species:	BF		BF	
DBH (mm)				
Height (m)	12.8		12.8	
Vol (cu.m/ha)				
Age (yr)	58		58	
S.I.	11.1		11.1	-
M.A.I. (cu.m/ha)	5.32		5.32	-

SITE DESCRIPTION SUMMARY

ECOREGION: BOREAL MIXEDWOOD

FOREST ECOSYSTEM: BMW 8 - BS/Ledum/Pleurozium - Okno

	PLOTS								
VARIABLE	4	8	9	21	28	78	MODAL	MEAN	RANGE
Elevation (m)	730	777	777	738	720	727		745	720-777
Landform	O/MI	O	O	O	O	O	O		
% Slope	1	0	0	0	0	0		0	0-1
Aspect	level	level	level	level	level	level	level		
Site Position:									
Macro	plain	plain	plain	valley	plain	plain	plain		
Meso	level	level	level	level	level	level	level		
Soil Subgroup	ptyHG	TY.M	TY.M	TY.M	T.M	T.M	TY.M		
Soil Series	SNTP	BYH	BYH	WKWX	OKO	OKO	var.		
Moist Regime (1-9)	9	9	8	8	8	8		8	8-9
Nutrient Regime (1-6)	5	2	2	1	1	1		2	1-5
Soil Drainage (1-6)	5	5.5	6	5	5	5		5	5-6
Humus:									
Form	MPtM	Anmor	Anmor	Anmor	Anmor	Anmor	Anmor		
Depth (cm)	30	150 +	150 +	150 +	100	110		115 +	30-150 +
Solum Depth (cm)	60 +	-	-	-	-	-		60 +	-
Texture:									
A Horizon					-	-	-		
B Horizon					-	-	-		
C Horizon					SiC	C	-		
Coarse Fragments:									
A Horizon	-							-	-
B Horizon	2							2	-
C Horizon	-							-	-
Family Particle Size	FL	O	O	O	O	O	O	-	-
Soil pH:									
LFH or Organic		6.7	7.2					7.0	6.7-7.2
A or Organic		6.6	6.9					6.8	6.6-6.9
B or Organic		5.8	6.6					6.2	5.8-6.6
C or Organic		5.8	6.3					6.1	5.8-6.3
Tree Species:	BS	BS	BS	BS	BS	BS		BS	
DBH (mm)									
Height (m)	13.0	12.8	12.5	13.1	14.7	11.7		13.0	11.7-14.7
Vol (cu.m/ha)									
Age (yr)	84	91	78	81	86	74		82.3	74-91
S.I.	8.8	12.8	8.9	9.1	9.9	8.7		9.7	8.7-12.8
M.A.I. (cu.m/ha)	1.55	2.71	1.52	1.72	1.42	1.30		1.7	1.30-2.71

SITE DESCRIPTION SUMMARY

ECOREGION: **BOREAL MIXEDWOOD**

FOREST ECOSYSTEM: **BMW 9 - BS/Ledum/Sphagnum - Okno**

	PLOTS			
VARIABLE	94	MODAL	MEAN	RANGE
Elevation (m)	733		733	-
Landform	O	O		
% Slope	0		0	-
Aspect	level	level		
Site Position:				
Macro	plain	plain		
Meso	level	level		
Soil Subgroup	T.M	T.M		
Soil Series	OKO	OOKX		
Moist Regime (1-9)	8		8	-
Nutrient Regime (1-6)	1		1	-
Soil Drainage (1-6)	5		5	-
Humus:				
Form	MptM	MptM		
Depth (cm)	110		110	-
Solum Depth (cm)	-		-	-
Texture:				
A Horizon	-			
B Horizon	-			
C Horizon	C			
Coarse Fragments:				
A Horizon				
B Horizon				
C Horizon				
Family Particle Size	O	O		
Soil pH:				
LFH or Organic				
A or Organic				
B or Organic				
C or Organic				
Tree Species:	BS		BS	
DBH (mm)				
Height (m)	11.9		11.9	
Vol (cu.m/ha)				
Age (yr)	80		80	
S.I.	8.3		8.3	
M.A.I. (cu.m/ha)	0.77		0.77	

SITE DESCRIPTION SUMMARY

ECOREGION: MID-BOREAL LOWLANDS

FOREST ECOSYSTEM: MBL 1 - JP/Hudsonia/Lichen - Kettlehills

	PLOTS					
VARIABLE	12	55	81	MODAL	MEAN	RANGE
Elevation (m)	351	351	351		351	-
Landform	Lr	E	E	E		
% Slope	0	10	4		5	0-10
Aspect	level	E	E	E		
Site Position:						
Macro	apex	up	low	var		
Meso	crest	up	low	var		
Soil Subgroup	E.DB	O.R	O.B	var		
Soil Series	SDI	KTS	KTS			
Moist Regime (1-9)	2	2	3		2	2-3
Nutrient Regime (1-6)	1	1	1		1	-
Soil Drainage (1-6)	1	1	1		1	-
Humus:						
Form	F Mor	-	-	-		
Depth (cm)	1	1	2		1	1-2
Solum Depth (cm)	60	120 +	120 +		90 +	60-120 +
Texture:						
A Horizon	S	-	-	S		
B Horizon		-	S	S		
C Horizon		S	-	S		
Coarse Fragments:						
A Horizon						
B Horizon						
C Horizon						
Family Particle Size	S	S	S	S		
Soil pH:						
LFH or Organic	-				-	
A or Organic	5.0				5.0	-
B or Organic	5.0				5.0	-
C or Organic	-					-
Tree Species:	JP	JP	JP		JP	
DBH (mm)						
Height (m)	6.8	6.3	22.7		11.9	6.3-22.7
Vol (cu.m/ha)						
Age (yr)	12	22	76		37	12-76
S.I.	12.9	11.6	16.4		13.7	11.6-16.4
M.A.I. (cu.m/ha)	0.30	0.03	0.07		0.13	0.03-0.30

SITE DESCRIPTION SUMMARY

ECOREGION: **MID-BOREAL LOWLANDS**

FOREST ECOSYSTEM: **MBL 2a - JP/Amelanchier/Arctostaphylos - Pine Ridge/Sandilands**

	PLOTS									
VARIABLE	40	41	43	46	47	83	87	MODAL	MEAN	RANGE
Elevation (m)	416	427	367	361	362	363	360		379	360-427
Landform	Fl	Fl	Fl	Fl	Fl	Fl	Fl	Fl		
% Slope	0	0	2	0	0	0	0		0	0-2
Aspect	level	level	W	level	level	level	level	level		
Site Position:										
Macro	plain	plain	plain	plain	plain	plain	plain	plain		
Meso	level	level	level	level	level	level	level	level		
Soil Subgroup	O.B	O.B	O.GL	E.DB	O.B	O.EB	E.EB	O.B		
Soil Series	PRG	PRG	WOG	SDI	PRG	SDI	PRG	PRG		
Moist Regime (1-9)	4	3	3	3	3	3	3		3	3-4
Nutrient Regime (1-6)	2	2	2	2	2	2	2		2	2-2
Soil Drainage (1-6)	1.5	1	2	1	1	1	2		1	1-2
Humus:										
Form	Mod	Mod	F.Mor	F.Mor	F.Mor	F.Mor	Mor	var		
Depth (cm)	8	6	7	7	14	8	4		8	4-14
Solum Depth (cm)	35	38	40	70	44	90	50		52	35-90
Texture:										
A Horizon	-	-	SL	FS	-	-	-	-		
B Horizon	SL.LS	S	SCL	FS	S	S	S	S		
C Horizon	SL	S	LS	FS	S	-	-	S		
Coarse Fragments:										
A Horizon	-	-	-		-				-	-
B Horizon	5	-	10		-				8	5-10
C Horizon	10	10	15		5				10	5-15
Family Particle Size	FS	S	FS	S	S	S	S	S		
Soil pH:										
LFH or Organic	5.0				5.8	3.5	-		4.8	3.5-5.8
A or Organic	-				-	-	6.0		6.0	-
B or Organic	7.2				7.1	6.5	7.0		7.0	6.5-7.2
C or Organic	6.5				7.2				6.8	6.5-7.2
Tree Species:	JP	JP	JP	JP	JP	JP	JP		JP	
DBH (mm)										
Height (m)	13.0	8.7	11.2	10.9	12.3	16.3	12.5		12.1	8.7-16.3
Vol (cu.m/ha)										
Age (yr)	45	32	36	31	32	87	46		44	31-87
S.I.	13.9	12.0	14.0	15.1	16.6	11.7	13.2		13.8	11.7-16.6
M.A.I. (cu.m/ha)	2.17	1.00	1.55	2.75	2.90	2.65	2.03		2.15	1.00-2.90

SITE DESCRIPTION SUMMARY

ECOREGION: MID-BOREAL LOWLANDS

FOREST ECOSYSTEM: MBL 2b - TA/Amelanchier/Arctostaphylos - Pine Ridge (Wintergreen)

VARIABLE	PLOTS 17	48	82	MODAL	MEAN	RANGE
Elevation (m)	355	363	360		359	355-363
Landform	Fl	Fl	Fl	Fl		
% Slope	2	0	2		0	0-2
Aspect	W	level	level	var.		
Site Position:						
Macro	low	plain	plain	plain		
Meso	low	mid	level	var.		
Soil Subgroup	GL.E.EB	O.B	GL.E.EB	GL.EEB		
Soil Series	WGE	PRG	WGE	WGE		
Moist Regime (1-9)	6	3	3		4	3-6
Nutrient Regime (1-6)	2	2	2		2	-
Soil Drainage (1-6)	1	1	4		2	1-4
Humus:						
Form	F.Mor	F.Mor	F.Mor	F.Mor		
Depth (cm)	8	7	10		8	7-10
Solum Depth (cm)	40	80	70		63	40-80
Texture:						
A Horizon	S	-	S	S		
B Horizon	S	S	S	S		
C Horizon	-	-	-	-		
Coarse Fragments:						
A Horizon	-				-	-
B Horizon	-				-	-
C Horizon	15				15	-
Family Particle Size	S	S	S	S		
Soil pH:						
LFH or Organic			-		-	-
A or Organic			5.5		5.5	-
B or Organic			7.0		7.0	-
C or Organic			-		-	-
Tree Species:	TA	TA	TA		TA	
DBH (mm)						
Height (m)	12.5	15.3	9.3		12.4	9.3-15.3
Vol (cu.m/ha)						
Age (yr)	22	70	19		37	19-70
S.I.	22.5	12.5	19.3		18.1	12.5-22.5
M.A.I. (cu.m/ha)	2.98	1.89	1.87		2.24	1.87-2.98

SITE DESCRIPTION SUMMARY

ECOREGION: **MID-BOREAL LOWLANDS**

FOREST ECOSYSTEM: **MBL 3 - JP/Ledum/Linnaea - Kerry**

	PLOTS					
VARIABLE	49	50	51	MODAL	MEAN	RANGE
Elevation (m)	351	351	351		351	-
Landform	Fl	Fl	Fl	Fl		
% Slope	1	0	0		0	0-1
Aspect	level	level	level	level		
Site Position:						
Macro	plain	plain	plain	plain		
Meso	level	level	level	level		
Soil Subgroup	O.G	O.G	GL.E.B	O.G		
Soil Series	KRY	KRY	WGE	KRY		
Moist Regime (1-9)	8	8	7		8	7-8
Nutrient Regime (1-6)	5	5	4		5	4-5
Soil Drainage (1-6)	5	5	5		5	-
Humus:						
Form	F.Mor	F.Mor	F.Mor	F.Mor		
Depth (cm)	12	11	5		9	5-12
Solum Depth (cm)	20	15	45		27	15-45
Texture:						
A Horizon	SiL	SiL	SL	SiL		
B Horizon	S	S	SCL	S		
C Horizon	S	S	LS	S		
Coarse Fragments:						
A Horizon	-	-	-		-	-
B Horizon	-	10	20		15	10-20
C Horizon	25	15	20		20	15-25
Family Particle Size	S	S	FS	S		
Soil pH:						
LFH or Organic						
A or Organic						
B or Organic						
C or Organic						
Tree Species:	JP	JP	JP		JP	
DBH (mm)						
Height (m)	6.3	6.4	6.8		6.5	6.3-6.8
Vol (cu.m/ha)						
Age (yr)	30	18	17		22	17-30
S.I.	9.2	13.7	15.1		12.7	9.2-15.1
M.A.I. (cu.m/ha)	0.30	0.01	0.16		0.15	0.01-0.30

SITE DESCRIPTION SUMMARY

ECOREGION: MID-BOREAL LOWLANDS

FOREST ECOSYSTEM: MBL 4 - JP/Vaccinum - Lonesand

	PLOTS						
VARIABLE	13	16	52	53	MODAL	MEAN	RANGE
Elevation (m)	351	351	351	351		351	-
Landform	Fl	Fl	Fl	Fl	Fl		
% Slope	0	2	0	0		0	0-2
Aspect	level	S	level	level	level		
Site Position:							
Macro	plain	mid	plain	plain	plain		
Meso	level	low	level	level	level		
Soil Subgroup	GL.E.DB	GL.E.EB	GL.E.DB	GL.E.DB	GL.E.DB		
Soil Series	LSD	WGE	LSD	LSD	LSD		
Moist Regime (1-9)	6	4	6	7		6	4-7
Nutrient Regime (1-6)	2	2	2	2		2	-
Soil Drainage (1-6)	5	4	4	5		5	4-5
Humus:							
Form	F.Mor	F.Mor	F.Mor	F.Mor	F.Mor		
Depth (cm)	7	9	4	4		6	4-9
Solum Depth (cm)	50	100	50	50		63	50-100
Texture:							
A Horizon	S	S	S	S	S		
B Horizon	S	S	S	S	S		
C Horizon	-	-	-	-			
Coarse Fragments:							
A Horizon							
B Horizon							
C Horizon							
Family Particle Size	S	S	S	S	S		
Soil pH:							
LFH or Organic	4.7	-	4.7			4.7	
A or Organic	3.9	5.0	5.4			4.8	3.9-5.4
B or Organic	4.7	6.0	5.1			5.3	4.7-6.0
C or Organic	-	-	-				-
Tree Species:	JP	JP	JP	JP		JP	
DBH (mm)							
Height (m)	8.3	8.0	8.3	7.2		8.0	7.2-8.3
Vol (cu.m/ha)							
Age (yr)	18	20	20	20		20	18-20
S.I.	17.3	15.5	16.1	14.1		15.8	14.1-17.3
M.A.I. (cu.m/ha)	0.71	1.33	0.35	0.02		0.60	0.02-1.33

SITE DESCRIPTION SUMMARY

ECOREGION: **MID-BOREAL LOWLANDS**

FOREST ECOSYSTEM: **MBL 5a - Populus/Corylus/Aralia - Pine Ridge/Waitville**

	PLOTS								
VARIABLE	37	38	62	67	68	70	MODAL	MEAN	RANGE
Elevation (m)	404	396	601	576	396	419		465	396-601
Landform	Fl	Fl	Mm	Mh-m	Fm	Fm	var		
% Slope	2	2	4	7	5	4		4	2-7
Aspect	?	N	NE	NE	NW	S	N		
Site Position:									
Macro	plain	plain	low	up	up	mid	var		
Meso	level	level	mid	mid	up	mid	var		
Soil Subgroup	O EB	O GL	O GL	O GL	O GL	GL GL	O GL		
Soil Series	PRG	PRG	WTV	WTV	PRG	WGE	PRG		
Moist Regime (1-9)	4	4	5	5	4	6		5	4-6
Nutrient Regime (1-6)	2	2	4	3	2	4		3	2-4
Soil Drainage (1-6)	2	2	3	2	2	5		[illegible]	2-5
Humus:									
Form	H Fib	F Mor	H Fib	F Mor	F Mor	H Fib			
Depth (cm)	15	8	14	6	7	22		12	6-22
Solum Depth (cm)	20	28	60	55	45	45		42	20-60
Texture:									
A Horizon	-	SL	SCL	L.CL	LS	SL	-		
B Horizon	L	CL	CL	CL	L	L	CL L		
C Horizon	SL	CL	SCL	CL	LS	SL.CL	-		
Coarse Fragments:									
A Horizon	-	-	-	-	-	-			-
B Horizon	-	-	2	-	10	-		6	2-10
C Horizon	50	10	5	2	25	5		16	2-50
Family Particle Size	FS	FL	FL	FL	FS	L	FS-FL		
Soil pH:									
LFH or Organic	5.3	6.1						5.7	5.3-6.1
A or Organic	-	6.3						6.3	
B or Organic	6.8	-						6.8	
C or Organic		7.2						7.2	
Tree Species:	BPO	TA	JP	TA	TA	TA			
DBH (mm)									
Height (m)	18.6	20.6	18.1	18.8	17.8	15.8			
Vol (cu m/ha)									
Age (yr)	87	46	86	66	51	52			
S.I.	13.8	21.6	13.3	16.0	17.6	15.4		16.3	13.3-21.6
M.A.I. (cu m/ha)	2.24	8.69	3.84	2.35	3.41	3.90		4.07	2.24-8.69

SITE DESCRIPTION SUMMARY

ECOREGION: **MID-BOREAL LOWLANDS**

FOREST ECOSYSTEM: **MBL 5b - WB/Corylus/Aralia - Pine Ridge/Waitville**

	PLOTS					
VARIABLE	42	66	69	MODAL	MEAN	RANGE
Elevation (m)	421	599	415		476	415-599
Landform	Fl	Mu	Fl	var.		
% Slope	0	2	0		0	0-2
Aspect	level	N	level	level		
Site Position:						
Macro	plain	up	plain	var		
Meso	level	up	level	var		
Soil Subgroup	O.GL	O.GL	ptyHG	O GL		
Soil Series	PRG	WTV	SUWP	var		
Moist Regime (1-9)	4	5	8		6	4-8
Nutrient Regime (1-6)	2	3	6		4	2-6
Soil Drainage (1-6)	2	3	6		4	2-6
Humus:						
Form	F.Mor	H.Fib	Anmor	-		
Depth (cm)	8	14	30		17	8-30
Solum Depth (cm)	35	48	10		31	10-48
Texture:						
A Horizon	SL	SiL	SiL	-		
B Horizon	SCL	CL.C	-	-		
C Horizon	LS	CL	LS.C	-		
Coarse Fragments:						
A Horizon	-		-		-	-
B Horizon	5		-		5	-
C Horizon	15		20		18	15-20
Family Particle Size	FS	FL	L	FS		
Soil pH:						
LFH or Organic	-				-	
A or Organic	4.5				4.5	
B or Organic	-				-	
C or Organic	-				-	
Tree Species:	TA	WB	TL			
DBH (mm)						
Height (m)	20.2	15.4	19.7			
Vol (cu.m/ha)						
Age (yr)	82	37	80			
S.I.	15.5	18.8	14.7		16.3	14.7-18.8
M.A.I.(cu.m/ha)	3.07	3.01	3.52		3.2	3.01-3.52

SITE DESCRIPTION SUMMARY

ECOREGION: **MID-BOREAL LOWLANDS**

FOREST ECOSYSTEM: **MBL 5c - JP/Corylus/Aralia - Waitville**

VARIABLE	PLOTS 65	MODAL	MEAN	RANGE
Elevation (m)	599		599	-
Landform	Mh	Mh		
% Slope	10		10	-
Aspect	SW	SW		
Site Position:				
Macro	mid	mid		
Meso	mid	mid		
Soil Subgroup	O.GL	O.GL		
Soil Series	WTV	WTV		
Moist Regime (1-9)	5		5	-
Nutrient Regime (1-6)	3		3	-
Soil Drainage (1-6)	2		2	-
Humus:				
Form	F Mor	F Mor		
Depth (cm)	7		7	-
Solum Depth (cm)	65		65	
Texture:				
A Horizon	SL.SCL	SL.SCL		
B Horizon	CL.C	CL.C		
C Horizon	CL	CL		
Coarse Fragments:				
A Horizon	-		-	-
B Horizon	2		2	-
C Horizon	5		5	-
Family Particle Size	FL	FL		
Soil pH:				
LFH or Organic				
A or Organic				
B or Organic				
C or Organic				
Tree Species:	JP		JP	
DBH (mm)				
Height (m)	18.7		18.7	-
Vol (cu.m/ha)				
Age (yr)	94		94	-
S.I.	13.1		13.1	-
M.A.I. (cu.m/ha)	3.52		3.52	-

SITE DESCRIPTION SUMMARY

ECOREGION: **MID-BOREAL LOWLANDS**

FOREST ECOSYSTEM: **MBL 6 - TA/Acer - Duck Mountain**

	PLOTS				
VARIABLE	57	86	MODAL	MEAN	RANGE
Elevation (m)	526	473		500	473-526
Landform	Mi	Fl	var.		
% Slope	57	4		31	4-57
Aspect	NE	N	N		
Site Position:					
Macro	up	up	up		
Meso	up	up	up		
Soil Subgroup	O.GL	O.GL	O.GL		
Soil Series	DKM	PRG	var.		
Moist Regime (1-9)	5	5		5	-
Nutrient Regime (1-6)	3	3		3	-
Soil Drainage (1-6)	2	2		2	-
Humus:					
Form	H.Fib	F.Mor	-		
Depth (cm)	15	11		13	11-15
Solum Depth (cm)	54	45		50	45-54
Texture:					
A Horizon	SICL	SL	-		
B Horizon	SIC	SCL	-		
C Horizon	CL	SL.S	-		
Coarse Fragments:					
A Horizon	-	-		-	-
B Horizon	5	2		4	2-5
C Horizon	5	-		5	-
Family Particle Size	FL	FS	FL		
Soil pH:					
LFH or Organic					
A or Organic					
B or Organic					
C or Organic					
Tree Species:	TA	TA		TA	
DBH (mm)					
Height (m)	25.8	19.3		22.6	19.3-25.8
Vol (cu.m/ha)					
Age (yr)	84	56		70	56-84
S.I.	20.0	18.1		19.0	18.1-20.0
M.A.I. (cu.m/ha)	3.22	4.15		3.68	3.22-4.15

SITE DESCRIPTION SUMMARY

ECOREGION: MID-BOREAL LOWLANDS

FOREST ECOSYSTEM: MBL 7 - Picea/Cornus stolonifera - Novra

	PLOTS			
VARIABLE	39	MODAL	MEAN	RANGE
Elevation (m)	387		387	-
Landform	Fl	Fl		
% Slope	1		1	-
Aspect	level	level		
Site Position:				
Macro	plain	plain		
Meso	level	level		
Soil Subgroup	O.G	O.G		
Soil Series	NOV	NOV		
Moist Regime (1-9)	8		8	-
Nutrient Regime (1-6)	5		5	-
Soil Drainage (1-6)	5		5	-
Humus:				
Form	F.Mor	F.Mor		
Depth (cm)	15		15	-
Solum Depth (cm)	10		10	-
Texture:				
A Horizon	-	-		
B Horizon	C	C		
C Horizon	C	C		
Coarse Fragments:				
A Horizon				
B Horizon				
C Horizon				
Family Particle Size	C	C-FL		
Soil pH:				
LFH or Organic	6.7		6.7	-
A or Organic	-		-	-
B or Organic	7.3		7.3	-
C or Organic	8.0		8.0	-
Tree Species:	WS		WS	
DBH (mm)				
Height (m)	19.6		19.6	
Vol (cu.m/ha)				
Age (yr)	48		48	
S.I.	20.3		20.3	
M.A.I. (cu.m/ha)	3.30		3.30	

SITE DESCRIPTION SUMMARY

ECOREGION: MID-BOREAL LOWLANDS

FOREST ECOSYSTEM: MBL 8a - BPO/Acer/Matteucia - Homestead

	PLOTS				
VARIABLE	60	85	MODAL	MEAN	RANGE
Elevation (m)	511	473		492	473-511
Landform	Lu-I	R	var.		
% Slope	4	3		4	3-4
Aspect	S	level	var.		
Site Position:					
Macro	valley	mid	var.		
Meso	low	upper	var.		
Soil Subgroup	HU.LG	CU.R	var.		
Soil Series	BKO	HMD	var.		
Moist Regime (1-9)	7	6		7	6-7
Nutrient Regime (1-6)	4	4		4	-
Soil Drainage (1-6)	5	2		4	2-5
Humus:					
Form	H.Fib-F.Hum	F.Mor	var.		
Depth (cm)	15	12		14	12-15
Solum Depth (cm)	50	3		27	3-50
Texture:					
A Horizon	SICL	LS	-		
B Horizon	SIL	-	-		
C Horizon	-	S	-		
Coarse Fragments:					
A Horizon		-		-	-
B Horizon		-		-	-
C Horizon		15		15	-
Family Particle Size	L	S	L		
Soil pH:					
LFH or Organic					
A or Organic					
B or Organic					
C or Organic					
Tree Species:	BPO	BPO		BPO	
DBH (mm)					
Height (m)	24.6	20.3		22.5	
Vol (cu.m/ha)					
Age (yr)	65	63		64	
S.I.	21.4	17.8		19.6	17.8-21.4
M.A.I. (cu.m/ha)	3.26	3.85		3.54	3.26-3.85

SITE DESCRIPTION SUMMARY

ECOREGION: **MID-BOREAL LOWLANDS**

FOREST ECOSYSTEM: **MBL 8b - WB/Acer/Matteucia - Homestead**

	PLOTS				
VARIABLE	59	61	MODAL	MEAN	RANGE
Elevation (m)	534	503		519	503-534
Landform	MI	Fu	var.		
% Slope	50	3		27	3-50
Aspect	N	S	var.		
Site Position:					
Macro	low	valley	var.		
Meso	up	mid	var.		
Soil Subgroup	GL.R	CU.R	R		
Soil Series	SNT	HMD	var.		
Moist Regime (1-9)	6	4		5	4-6
Nutrient Regime (1-6)	4	3		4	3-4
Soil Drainage (1-6)	3	1		2	1-3
Humus:					
Form	F.Mor	H.Fib	var.		
Depth (cm)	8	10		9	8-10
Solum Depth (cm)	0	5		3	0-5
Texture:					
A Horizon	-	LS	-		
B Horizon	-	-	-		
C Horizon	CL	LS	-		
Coarse Fragments:					
A Horizon	-	-		-	-
B Horizon	-	-		-	-
C Horizon	10	20		15	10-20
Family Particle Size	FS	FS	L		
Soil pH:					
LFH or Organic					
A or Organic					
B or Organic					
C or Organic					
Tree Species:	WB	WB		WB	
DBH (mm)					
Height (m)	21.1	19.8		20.5	19.8-21.1
Vol (cu.m/ha)					
Age (yr)	79	65		72	65-79
S.I.	16.5	17.1		16.8	16.5-17.1
M.A.I. (cu.m/ha)	2.38	5.06		3.72	2.38-5.06

SITE DESCRIPTION SUMMARY

ECOREGION: MID-BOREAL LOWLANDS

FOREST ECOSYSTEM: MBL 8c - WE/Acer Matteucia - Homestead

	PLOTS			
VARIABLE	84	MODAL	MEAN	RANGE
Elevation (m)	404		404	-
Landform	Fl	Fl		
% Slope	5		5	-
Aspect	NW	NW		
Site Position:				
Macro	valley	valley		
Meso	up	up		
Soil Subgroup	GLCU.R	GLCU.R		
Soil Series	NOV	NOV		
Moist Regime (1-9)	6		6	-
Nutrient Regime (1-6)	4		4	-
Soil Drainage (1-6)	4		4	-
Humus:				
Form	H.Fib	H.Fib		
Depth (cm)	13		13	-
Solum Depth (cm)	4		4	-
Texture:				
A Horizon	FSL	FSL		
B Horizon	-	-		
C Horizon	LS	LS		
Coarse Fragments:				
A Horizon	-		-	-
B Horizon	-		-	-
C Horizon	10		10	-
Family Particle Size	FS	FS		
Soil pH:				
LFH or Organic				
A or Organic				
B or Organic				
C or Organic				
Tree Species:	TA		TA	
DBH (mm)				
Height (m)	19.3		19.3	-
Vol (cu.m/ha)				
Age (yr)	89		89	-
S.I.	14.2		14.2	-
M.A.I. (cu.m/ha)	1.33		1.33	-

SITE DESCRIPTION SUMMARY

ECOREGION: **MID-BOREAL LOWLANDS**

FOREST ECOSYSTEM: **MBL 9 - BF - Waitville**

	PLOTS				
VARIABLE	56	58	MODAL	MEAN	RANGE
Elevation (m)	541	511		526	511-541
Landform	Mi	MI	var.		
% Slope	3	3		3	-
Aspect	N	E	var.		
Site Position:					
Macro	up	plain	var.		
Meso	mid	low	var.		
Soil Subgroup	O.GL	O.GL	O.GL		
Soil Series	WTV	WTV	WTV		
Moist Regime (1-9)	5	5		5	-
Nutrient Regime (1-6)	3	3		3	-
Soil Drainage (1-6)	2	2		2	-
Humus:					
Form	F.Mor	F.Mor	F Mor		
Depth (cm)	10	8		9	8-10
Solum Depth (cm)	65	50		58	50-65
Texture:					
A Horizon	SL	SiL	-		
B Horizon	CL	CL	CL		
C Horizon	CL	CL	CL		
Coarse Fragments:					
A Horizon	-	-		-	-
B Horizon	-	-		-	-
C Horizon	2	2		2	-
Family Particle Size	FL	FL	FL		
Soil pH:					
LFH or Organic	5.7			5.7	-
A or Organic	4.9			4.9	-
B or Organic	-			-	-
C or Organic	7.5			7.5	-
Tree Species:	BF			BF	
DBH (mm)					
Height (m)	17.6			17.6	
Vol (cu.m/ha)					
Age (yr)	56			56	
S.I.	16.0			16.0	
M.A.I. (cu.m/ha)	4.87	5.82		5.34	5.87-5.82

SITE DESCRIPTION SUMMARY

ECOREGION: MID-BOREAL LOWLANDS

FOREST ECOSYSTEM: MBL 10 - WS/Hylocomium - Novra

VARIABLE	PLOTS 71	MODAL	MEAN	RANGE
Elevation (m)	381		381	-
Landform	Fl	Fl		
% Slope	0		0	-
Aspect	level	level		
Site Position:				
Macro	plain	plain		
Meso	level	level		
Soil Subgroup	O.G	O.G		
Soil Series	NOV	NOV		
Moist Regime (1-9)	6		6	-
Nutrient Regime (1-6)	5		5	-
Soil Drainage (1-6)	4		4	-
Humus:				
Form	F.Mor	F.Mor		
Depth (cm)	17		17	-
Solum Depth (cm)	15		15	-
Texture:				
A Horizon	-	-		
B Horizon	SL	SL		
C Horizon	SiCL	SiCL		
Coarse Fragments:				
A Horizon	-		-	-
B Horizon	5		5	-
C Horizon	5		5	-
Family Particle Size	C	C		
Soil pH:				
LFH or Organic				
A or Organic				
B or Organic				
C or Organic				
Tree Species:	WS		WS	
DBH (mm)				
Height (m)	17.9		17.9	
Vol (cu.m/ha)				
Age (yr)	62		62	
S.I.	14.9		14.9	
M.A.I. (cu.m/ha)	3.27		3.27	

SITE DESCRIPTION SUMMARY

ECOREGION: **MID-BOREAL LOWLANDS**

FOREST ECOSYSTEM: **MBL 11 - BS/Ledum/Sphagnum - Kirco**

	PLOTS					
VARIABLE	14	15	54	MODAL	MEAN	RANGE
Elevation (m)	351	351	351		351	-
Landform	O	O	O/U	O		
% Slope	0	0	0		0	-
Aspect	level	level	level	level		
Site Position:						
Macro	plain	plain	plain	plain		
Meso	level	level	level	level		
Soil Subgroup	T.M	TY.M	ptyHG	var.		
Soil Series	KIC	KIC	KRY	KIC		
Moist Regime (1-9)	9	8	8		9	8-9
Nutrient Regime (1-6)	5	5	5		5	-
Soil Drainage (1-6)	5	6	6		6	5-6
Humus:						
Form	FptM	Anmor	MptM	var.		
Depth (cm)	80	150 +	35		88	35-150 +
Solum Depth (cm)	-	-	70		70	-
Texture:						
A Horizon	-		SL	-		
B Horizon	-		S	-		
C Horizon	S		-	-		
Coarse Fragments:						
A Horizon						
B Horizon						
C Horizon						
Family Particle Size	O/S	O	S	O/S		
Soil pH:						
LFH or Organic						
A or Organic						
B or Organic						
C or Organic						
Tree Species:	BS	BS	BS		BS	
DBH (mm)						
Height (m)	7.3	5.7	7.0		6.7	5.7-7.3
Vol (cu.m/ha)						
Age (yr)	65	40	73		59	40-73
S.I.	5.9	6.8	5.2		6.0	5.2-6.8
M.A.I. (cu.m/ha)	0.30	0.13	0.42		0.28	0.13-0.42

SITE DESCRIPTION SUMMARY

ECOREGION: MID-BOREAL LOWLANDS

FOREST ECOSYSTEM: MBL 12 - JP/Pleurozium - Waitville

VARIABLE	PLOTS 44	63	64	MODAL	MEAN	RANGE
Elevation (m)	367	598	598		521	367-598
Landform	Fu/Mu	Ml-u	Mu	Mu		
% Slope	3	2	3		3	2-3
Aspect	SW	NE	SW	var.		
Site Position:						
Macro	plain	low	mid	var.		
Meso	level	mid	mid	var.		
Soil Subgroup	O.GL	O.GL	O.GL	O.GL		
Soil Series	CLO	WTV	WTV	WTV		
Moist Regime (1-9)	5	5	5		5	-
Nutrient Regime (1-6)	3	3	3		3	-
Soil Drainage (1-6)	3	3	3		3	-
Humus:						
Form	F.Mor	F.Mor	F.Mor	F.Mor		
Depth (cm)	7	8	7		7	7-8
Solum Depth (cm)	35	60	65		53	35-65
Texture:						
A Horizon	SL	SCL	SL	SL		
B Horizon	SCL	CL	CL,SiCL	-		
C Horizon	LS,SiC	SCL	SiCL	-		
Coarse Fragments:						
A Horizon	-	-	-		-	-
B Horizon	5	5	2		4	2-5
C Horizon	4	10	5		6	4-10
Family Particle Size	S-C	FL	C	FL		
Soil pH:						
LFH or Organic	-	-	-		-	-
A or Organic	4.5	-	6.5		5.5	4.5-6.5
B or Organic	-	-	-		-	-
C or Organic						
Tree Species:	JP	JP	JP	JP		
DBH (mm)						
Height (m)	21.1	22.3	18.4		20.6	18.4-22.3
Vol (cu.m/ha)						
Age (yr)	91	91	88		90	88-91
S.I.	15.4	16.4	13.4		15.1	13.4-16.4
M.A.I. (cu.m/ha)	4.01	3.26	3.26		3.51	3.26-4.01

SITE DESCRIPTION SUMMARY

ECOREGION: **MID-BOREAL LOWLANDS**

FOREST ECOSYSTEM: **MBL 13 - BS/Pleurozium - Hylocomium - Meleb**

VARIABLE	PLOTS 45	MODAL	MEAN	RANGE
Elevation (m)	367		367	-
Landform	Lv/Ml	Lv/Ml		
% Slope	0		0	-
Aspect	level	level		
Site Position:				
Macro	plain	plain		
Meso	level	level		
Soil Subgroup	O.G	O.G		
Soil Series	MEB	MEB		
Moist Regime (1-9)	8		8	-
Nutrient Regime (1-6)	5		5	-
Soil Drainage (1-6)	5		5	-
Humus:				
Form	F.Mor	F Mor		
Depth (cm)	10		10	-
Solum Depth (cm)	40		40	-
Texture:				
A Horizon	-	-		
B Horizon	FSL	FSL		
C Horizon	SiCL,SiC	SiCL		
Coarse Fragments:				
A Horizon	-		-	-
B Horizon	-		-	-
C Horizon	2		2	-
Family Particle Size	FL	FL		
Soil pH:				
LFH or Organic	4.8		4.8	-
A or Organic	-		-	-
B or Organic	7.0		7.0	-
C or Organic	8.4		8.4	-
Tree Species:	JP		JP	
DBH (mm)				
Height (m)	19.7		19.7	
Vol (cu.m/ha)				
Age (yr)	89		89	
S.I.	14.4		14.4	
M.A.I. (cu.m/ha)	3.09		3.09	

APPENDIX IV

SOIL LAB DATA

SOIL CHARACTERIZATION ANALYSES

SOIL NAME: **BYHX - Baynham**

SOIL CLASSIFICATION: **Typic Mesisol/peat**

SITE NUMBER AND LOCATION: **9 - 725E 489N**

			% of <2 mm							
Horizon	Depth (cm)	CaCl pH	Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
Of	0-20	7.2	-	-	-	-	-	-	-	-
Of	20-40	6.9	-	-	-	-	-	-	-	-
Om	40-80	6.6	-	-	-	-	-	-	-	-
Om	80-120	6.3	-	-	-	-	-	-	-	-
Om	120-150	6.7	-	-	-	-	-	-	-	-

		Exchangeable (me/100 g)					Fibre		
Horizon	(cm)	CEC	Ca	Mg	K	Na	Rubbed	Unrubbed	B.D.
Of	0-20	57.7	30.0	1.37	0.42	0.28	53.7	62.1	-
Of	20-40	59.0	32.1	0.13	0.39	0.28	55.3	66.5	-
Om	40-80	60.3	18.2	<.77	0.51	0.26	57.6	67.8	-
Om	80-120	63.1	16.1	<.77	0.55	0.38	55.3	61.9	-
Om	120-150	63.9	17.5	<.77	0.51	0.29	61.6	76.7	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME: **BKO - Breckon (peaty)**

SOIL CLASSIFICATION: **Humic Luvic Gleysol/lacustrine clays**

SITE NUMBER AND LOCATION: **60 - 810E 588N**

			% of <2 mm							
Horizon	Depth (cm)	CaCl pH	Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
LFH	15-0	6.5	-	-	-	0	79	46.0	1.93	24
Aeg	10-23	7.1	29	53	18	SiL	1.2	0.71	0.08	8.8
Btg	23-50	7.1	22	58	20	SiL	-	-	-	-
BCg	50-85	7.3	22	58	20	SiL	-	-	-	-

		Exchangeable (me/100 g)							
Horizon	Depth (cm)	CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
LFH	15-0	149	20.5	5.62	1.73	0.43	19	-	-
Aeg	10-23	20.3	12.2	5.17	0.29	0.10	87	-	1.43
Btg	23-50	20.1	10.8	5.29	0.36	0.07	82	-	1.53
BCg	50-85	-	-	-	-	-	-	0.40	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME:	**DKM - Duck Mountain**
SOIL CLASSIFICATION:	**Orthic Gray Luvisol/lacustrine veneer over till**
SITE NUMBER AND LOCATION:	**25 - 693E 487N**

			% of <2 mm							
Horizon	Depth (cm)	CaCl pH	Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
LFH	12-0	4.7	-	-	-	0	56	32.8	1.98	17
Ae	0-10	4.3	39	36	25	L	3.2	1.87	0.21	8.9
Bt	10-5	4.1	23	21	56	C	-	-	-	-
Ck	80-90	7.3	33	27	40	C	-	-	-	-

		Exchangeable (me/100 g)							
Horizon	Depth (cm)	CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
LFH	12-0	62.9	40.8	8.76	1.95	1.64	84	-	-
Ae	0-10	26.7	14.4	2.93	0.18	0.12	66	-	0.99
Bt	10-5	40.6	19.4	10.9	0.90	0.13	77	-	1.46
Ck	80-90	-	-	-	-	-	-	8.20	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME:	**KRY - Kerry**
SOIL CLASSIFICATION:	**Orthic Gleysol/partially sorted beach sands**
SITE NUMBER AND LOCATION:	**71 - 847E 612N**

Horizon	Depth (cm)	CaCl pH	% of <2 mm			Texture	OM%	C%	N%	C/N
			Sand	Silt	Clay					
LFH	17-0	7.0	-	-	-	0	44	25.8	0.92	28
Bg	0-15	7.6	64	20	16	SL	-	-	-	-
Ccag1	40-65	7.8	78	10	12	SL	-	-	-	-
Ccag2	65-85	7.8	38	42	20	L	-	-	-	-

Horizon	Depth (cm)	Exchangeable (me/100 g)					Base Sat%	% CaC03	B.D.
		CEC	Ca	Mg	K	Na			
LFH	17-0	89.1	37.3	7.44	0.65	1.44	51	-	-
Bg	0-15	20.1	14.2	6.07	0.17	0.29	100	-	1.28
Ccag1	40-65	-	-	-	-	-	-	14.8	-
Ccag2	65-85	-	-	-	-	-	-	20.6	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME:	**LSD - Lonesand**
SOIL CLASSIFICATION:	**Gleyed Eluviated Dystric Brunisol/beach ridge sands**
SITE NUMBER AND LOCATION:	**13 - 909E 718N**

Horizon	Depth (cm)	CaCl pH	% of <2 mm Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
LF	7-0	4.7	-	-	-	0	33	19.0	0.96	20
Ae	0-13	3.9	95	2	3	S	2.7	1.57	0.08	20
Bg	13-21	4.7	98	0	2	S	-	-	-	-
BC	50 +	4.8	97	0	3	S	-	-	-	-

Horizon	Depth (cm)	Exchangeable (me/100 g) CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
LF	7-0	32.6	22.3	4.75	0.19	0.08	83	-	-
Ae	0-13	4.15	0.98	0.25	<.01	<.01	30	-	-
Bg	13-21	2.33	0.10	0.05	<.01	<.01	6	-	-
BC	50 +	-	-	-	-	-	-	0.20	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME:	**LSD - Lonesand**
SOIL CLASSIFICATION:	**Gleyed Eluviated Dystric Brunisol/beach ridge sands**
SITE NUMBER AND LOCATION:	**52 - 933E 717N**

Horizon	Depth (cm)	CaCl pH	% of <2 mm Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
F	4-0	4.7	-	-	-	0	14	8.00	0.23	34
Ae	0-8	5.4	96	2	2	S	0.6	0.36	0.01	28
Bg	8-50	5.1	96	2	2	S	-	-	-	-
BCg	50-80	5.2	97	1	2	S	-	-	-	-

Horizon	Depth (cm)	Exchangeable (me/100 g) CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
F	4-0	22.3	7.95	3.06	0.77	0.47	49	-	-
Ae	0-8	2.40	0.46	0.25	<.77	<.01	30	-	-
Bg	8-50	1.94	0.13	0.13	<.77	<.01	13	-	1.40
BCg	50-80	-	-	-	-	-	-	0.30	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME:	**PRG - Pine Ridge**
SOIL CLASSIFICATION:	**Orthic Eutric Brunisol/poorly sorted fluvial fan**
SITE NUMBER AND LOCATION:	**37 - 820E 659N**

Horizon	Depth (cm)	CaCl pH	% of < 2 mm Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
LFH	15-0	5.8	-	-	-	0	71	41.3	1.68	25
Btj	0-20	7.3	49	29	22	L	-	-	-	-
Ck	20-45	7.7	58	26	16	SL	-	-	-	-

Horizon	Depth (cm)	Exchangeable (me/100 g) CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
LFH	15-0	102	38.8	15.0	2.09	< .01	54	-	-
Btj	0-20	39.1	28.0	7.60	0.56	< .01	93	-	-
Ck	20-45	-	-	-	-	-	-	20.1	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME:	**SDI - Sandilands**
SOIL CLASSIFICATION:	**Eluviated Dystric Brunisol/beach ridge sands**
SITE NUMBER AND LOCATION:	**12 - 918E 727N**

			% of <2 mm							
Horizon	Depth (cm)	CaCl pH	Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
Ae	0-3	5.0	96	1	3	S	0.9	0.53	0.03	18
Bm1	3-15	4.9	96	1	3	S	-	-	-	-
Bm2	15-60	5.1	97	1	2	S	-	-	-	-
BC	60-100	6.0	98	0	2	S	-	-	-	-

		Exchangeable (me/100 g)							
Horizon	Depth (cm)	CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
Ae	0-3	3.26	1.42	0.27	<.77	<.01	52	-	1.38
Bm1	3-15	1.91	0.12	0.03	<.01	<.01	8	-	-
Bm2	15-60	1.35	0.06	0.02	<.01	<.01	6	-	-
BC	60-100	-	-	-	-	-	-	0.30	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME:	**VRL - Verrall Lake**
SOIL CLASSIFICATION:	**Gleyed Gray Luvisol/lacustrine blanket over till**
SITE NUMBER AND LOCATION:	**95 - 694E 459N**

Horizon	Depth (cm)	CaCl pH	% of <2 mm Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
LF	9-0	4.6	-	-	-	0	20	11.3	0.72	16
Ae	0-7	4.2	36	48	16	L	1.4	0.83	0.09	8.9
Bt	7-45	4.8	16	33	51	C	-	-	-	-
Ckg	65-85	7.2	20	40	40	C	-	-	-	-

Horizon	Depth (cm)	Exchangeable (me/100 g) CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
LF	9-0	40.6	18.1	8.9	1.89	0.53	72	-	-
Ae	0-7	2.91	3.45	1.28	0.12	0.03	100	-	1.52
Bt	7-45	16.0	18.4	10.9	0.45	0.28	100	-	-
Ckg	65-85	-	-	-	-	-	-	15.3	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME:	**WTV - Waitville**
SOIL CLASSIFICATION:	**Orthic Gray Luvisol/till**
SITE NUMBER AND LOCATION:	**7 - 724E 485N**

			% of <2 mm							
Horizon	Depth (cm)	CaCl pH	Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
LFH	10-0	5.1	-	-	-	0	32	18.5	1.13	16
Ahe	0-4	4.4	59	31	10	SL	1.8	1.04	0.13	8.1
Ae	4-20	4.4	57	31	12	SL	0.9	0.52	0.05	11
Bt	20-50	4.9	49	21	30	SCL	-	-	-	-
Ck	75 +	7.1	51	29	20	L	-	-	-	-

		Exchangeable (me/100 g)							
Horizon	Depth (cm)	CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
LFH	10-0	54.2	28.6	9.91	1.94	0.20	75	-	-
Ahe	0-4	8.51	2.72	1.07	0.16	<.01	46	-	-
Ae	4-20	6.23	1.95	0.87	0.07	<.01	46	-	-
Bt	20-50	19.1	10.0	6.45	0.42	0.05	88	-	-
Ck	75 +	-	-	-	-	-	-	6.6	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME:	**WTV - Waitville**
SOIL CLASSIFICATION:	**Brunisolic Gray Luvisol/skeletal bouldery till**
SITE NUMBER AND LOCATION:	**22 - 743E 506N**

Horizon	Depth (cm)	CaCl pH	% of <2 mm Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
LFH	11-0	5.4	-	-	-	0	11	6.65	0.90	7.4
Bm	0-8	4.6	69	19	12	SL	-	-	-	-
Bt	8-35	6.1	59	18	23	SCL	-	-	-	-
BC	50-75	7.6	71	17	12	SL	-	-	-	-

Horizon	Depth (cm)	Exchangeable (me/100 g) CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
LFH	11-0	19.2	28.4	6.37	0.38	0.11	100	-	-
Bm	0-8	8.23	1.90	1.32	0.08	<.01	39	-	1.02
Bt	8-35	19.7	10.7	7.07	0.26	0.12	90	-	-
BC	50-75	-	-	-	-	-	-	14.2	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME: WTV - Waitville

SOIL CLASSIFICATION: Orthic Gray Luvisol/till

SITE NUMBER AND LOCATION: 23 - 742E 505N

			% of < 2 mm							
Horizon	Depth (cm)	CaCl pH	Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
LFH	14-0	5.1	-	-	-	0	59	34.1	1.63	21
Ae	0-12	4.5	51	41	8	L	2.3	1.31	0.14	9.6
Bt	12-45	5.6	51	17	32	SCL	-	-	-	-
BC	60-80	6.8	59	22	19	SL	-	-	-	-

		Exchangeable (me/100 g)							
Horizon	Depth (cm)	CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
LFH	14-0	59.4	38.5	10.7	3.13	<.01	88	-	-
Ae	0-12	8.8	3.3	1.36	0.51	<.01	59	-	1.08
Bt	12-45	23.1	12.4	6.86	0.53	<.01	86	-	-
BC	-	-	-	-	-	-	-	4.10	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME: **WTV - Waitville**

SOIL CLASSIFICATION: **Orthic Gray Luvisol/till**

SITE NUMBER AND LOCATION: **36 - 762E 508N**

Horizon	Depth (cm)	CaCl pH	% of <2 mm Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
LFH	10-0	5.5	-	-	-	0	68	39.3	1.77	22
Ae	0-15	4.7	75	15	10	SL	1.2	0.67	0.07	9.2
Bt	25-60	4.8	39	25	36	CL	-	-	-	-
Ck	60-90	7.0	45	25	30	CL	-	-	-	-

Horizon	Depth (cm)	Exchangeable (me/100 g) CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
LFH	10-0	76.6	60.7	9.34	2.56	<.01	95	-	-
Ae	0-15	8.0	3.7	1.16	0.15	<.01	63	-	-
Bt	25-60	26.4	11.4	7.15	0.58	<.01	73	-	-
Ck	60-90	-	-	-	-	-	-	6.40	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME:	**WTV - Waitville**
SOIL CLASSIFICATION:	**Orthic Gray Luvisol/till**
SITE NUMBER AND LOCATION:	**66 - 795E 592N**

			% of <2 mm							
Horizon	Depth (cm)	CaCl pH	Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
LFH	14-0	5.1	-	-	-	0	54	31.5	1.16	27
Ae	0-12	5.8	49	35	16	L	1.7	1.0	0.11	9.2
Bt	12-48	5.9	40	24	36	CL	-	-	-	-
Ck	48-65	7.6	44	34	22	L	-	-	-	-

		Exchangeable (me/100 g)							
Horizon	Depth (cm)	CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
LFH	14-0	96.0	7.80	2.89	1.69	1.4	16	-	-
Ae	0-12	16.4	7.95	4.21	0.10	0.07	75	-	-
Bt	12-48	24.4	16.5	8.68	0.58	0.14	100	-	1.24
Ck	48-65	-	-	-	-	-	-	11.9	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME:	**WTV - Waitville**
SOIL CLASSIFICATION:	**Orthic Gray Luvisol/till**
SITE NUMBER AND LOCATION:	**90 - 788E 512N**

Horizon	Depth (cm)	CaCl pH	% of <2 mm			Texture	OM%	C%	N%	C/N
			Sand	Silt	Clay					
LFH	14-0	6.1	-	-	-	0	40	23.1	1.28	18
Ae	3-18	5.8	58	32	10	SL	1.4	0.8	0.11	7.6
Bt	18-55	5.3	44	23	33	CL	-	-	-	-
Ck	75-100	7.4	46	31	23	L	-	-	-	-

Horizon	Depth (cm)	Exchangeable (me/100 g)					Base Sat%	% CaC03	B.D.
		CEC	Ca	Mg	K	Na			
LFH	14-0	88.0	28.6	6.94	2.14	0.64	44	-	-
Ae	3-18	11.5	5.45	2.19	0.08	0.07	67	-	1.14
Bt	18-55	27.5	13.2	6.90	0.56	0.13	75	-	1.42
Ck	75-100	-	-	-	-	-	-	10.5	-

SOIL CHARACTERIZATION ANALYSES

SOIL NAME: **WGE - Wintergreen**

SOIL CLASSIFICATION: **Gleyed Eluviated Eutric Brunisol/fluvial fan (watertable at 50 cm)**

SITE NUMBER AND LOCATION: **51 - 899E 759N**

Horizon	Depth (cm)	CaCl pH	% of < 2 mm Sand	Silt	Clay	Texture	OM%	C%	N%	C/N
LF	[illegible]	6.9	-	-	-	0	6.7	3.91	0.18	22
Ae	[illegible]11	7.2	87	8	5	LS	0.8	0.48	0.02	20
Bg	11-45	7.7	72	18	10	SL	-	-	-	-
Ckg	45-65	7.9	92	4	4	S	-	-	-	-

Horizon	Depth (cm)	Exchangeable (me/100 g) CEC	Ca	Mg	K	Na	Base Sat%	% CaC03	B.D.
LF	5-0	19.2	13.8	2.98	0.19	< .01	87	-	-
Ae	0-11	5.34	3.70	1.61	< .77	0.02	100	-	-
Bg	11-45	13.4	18.2	3.7	0.02	0.11	100	-	-
Ckg	45-65	-	-	-	-	-	-	7.50	-

APPENDIX V

LIST OF PLANT SPECIES

LIST OF PLANT SPECIES

TREES

Abies balsamea (L.) Mill.
Acer negundo L.
Betula papyrifera Marsh.
Fraxinus pennsylvanica Marsh. var. austini Fern.
Larix laricina (du Roi) K. Koch
Picea glauca (Moench) Voss
Picea mariana (Mill.) BSP
Pinus banksiana Lamb.
Populus balsamifera L.
Populus tremuloides Michx.
Ulmus americana L.

SHRUBS

Acer spicatum Lam.
Alnus crispa (Ait.) Pursh
Alnus rugosa (Du Roi) Spreng. var. americana (Regel) Fern.
Amelanchier alnifolia Nutt.
Betula glandulosa Michx.
Chamaedaphne calyculata (L.) Moench
Cornus alternifolia L.f.
Cornus stolonifera Michx.
Corylus cornuta Marsh.
Diervilla lonicera Mill.
Juniperus horizontalis Moench
Ledum groenlandicum Oeder
Lonicera dioica L. var. glaucescens (Rydb.) Butters
Lonicera villosa (Michx.) R. & S. var. solonis (Eat) Fern.
Potentilla fruticosa L.
Prunus pensylvanica L.f.
Prunus virginiana L.
Ribes glandulosum Grauer.
Ribes hirtellum Michx.
Ribes hudsonianum Richards.
Ribes lacustre (Pers.) Poir.
Ribes oxyacanthoides L.
Ribes triste Pall.
Rosa woodsii Lindl. / R. acicularis Lindl.
Rubus idaeus L.
Salix bebbiana Sarg.
Salix glauca L.
Salix lanata L.
Shepherdia canadensis (L.) Nutt.
Sorbus decora (Sarg.) Schn.
Spiraea alba Du Roi
Symphoricarpos albus (L.) Blake
Vaccinium angustifolium Ait.

SHRUBS (Cont'd)

Vaccinium caespitosum Michx.
Vaccinium myrtilloides Michx.
Viburnum edule (Michx.) Raf.
Viburnum trilobum Marsh.

HERBS AND DWARF SHRUBS

Achillea sibirica Ledeb.
Actea rubra (Ait.) Willd.
Agropyron repens (L.) Beauv.
Agropyron trachycaulum (Link) Malte
Agropyron trachycaulum var. unilaterale (Cassidy) Malte
Agrostis scabra Willd.
Andromeda glaucophylla Link
Anropogon scoparius Michx.
Anemone multifida Poir.
Anemone quinquefolia L. var. interior Fern.
Anemone riparia Fern.
Apocynum androsaemifolium L.
Aralia nudicaulis L.
Arctostaphylos uva-ursi (L.) Spreng.
Artemisia caudata Michx.
Aster ciliolatus Lindl.
Aster laevis L.
Aster puniceus L.
Athyrium felix-femina Roth var. michauxii (Spreng.) Farw.
Botrychium virginianum (L.) Sw.
Bromus ciliatus L.
Bromus porteri (Coult.) Nash
Calamagrostis canadensis (Michx.) Nutt.
Caltha palustris L.
Campanula rotundifolia L.
Carex aenea Fern.
Carex brunnescens (Pers.) Poir.
Carex disperma Dew.
Carex interior Bailey
Carex lenticularis Michx.
Carex leptalea Wahl.
Carex loliacea L.
Carex paupercula Michx.
Carex vaginata Tausch
Chimaphila umbellata (L.) Bart. var. occidentalis (Rydb.) Blake
Cinna latifolia (Trev.) Griseb.
Circaea alpina L.
Coptis trifolia (L.) Salisb. var. groenlandica (Oeder) Fassett
Corallorhiza maculata Raf.
Cornus canadensis L.
Danthonia spicata (L.) Beauv.
Deschampsia caespitosa (L.) Beauv.
Disporum trachycarpum (Wats.) B. & H.
Dryopteris spinulosa (O.F. Muell.) Watt.

HERBS AND DWARF SHRUBS (Cont'd)

Elymus canadensis L.
Elymus innovatus Beal
Empetrum nigrum L.
Epilobium angustifolium L.
Epilobium palustre L.
Equisetum arvense L.
Equisetum fluviatile L.
Equisetum hyemale L.
Equisetum pratense Ehrh.
Equisetum scirpoides Michx.
Equisetum sylvaticum L.
Erigeron glabellus Nutt.
Festuca ovina var. saximontana (Rydb.) Gl.
Fragaria virginiana Duchesne
Galium boreale Am.
Galium triflorum Michx.
Gentiana crinita Froel.
Geocaulon lividum (Richards.) Fern.
Goodyera repens (L.) R.Br. var. ophioides Fern.
Gymnocarpium dryopteris Newm.
Habenaria hyperborea (L.) R.Br.
Habenaria obtusata (Pursh) Richards.
Habenaria orbiculata (Pursh) Torr.
Heracleum lanatum Michx.
Heuchera richardsonii R.Br.
Hieracium canadense Michx.
Hudsonia tomentosa Nutt.
Juniperus horizontalis Moench
Koeleria cristata (L.) Pers.
Lathyrus ochroleucus Hook.
Lilium philadelphicum L.
Linnaea borealis L. var. americana (Forbes) Rehd.
Listera borealis Morong
Luzula parviflora (Ehrh.) Desv.
Lycopodium annotinum L.
Lycopodium complanatum L.
Lycopodium obscurum L.
Lysimachia ciliata L.
Maianthemum canadense Desf.
Matteucia struthiopteris (L.) Todaro var. pensylvanica (Willd.) Morton
Menyanthes trifoliata L.
Mertensia paniculata (Ait.) G.Don.
Milium effuscum L.
Mitella nuda L.
Monotropa uniflora L.
Muhlenbergia racemosa (Michx.) BSP.
Osmorhiza chilensis H. & A.
Osmorhiza longistylis (Torr.) DC.
Oxycoccus quadripetalus Gilib.
Parnassia multiseta (Ledeb.) Fern.
Petasites palmatus (Ait.) Gray
Petasites sagittatus (Pursh) Gray

HERBS AND DWARF SHRUBS (Cont'd)

Petasites vitifolius Greene
Potentilla palustris (L.) Scop.
Prenanthes alba L.
Pyrola asarifolia Michx.
Pyrola secunda L.
Ranunculus lapponicus L.
Rubus chamaemorus L.
Rubus pubescens Raf.
Sanicula marilandica L.
Sarracenia purpurea L.
Schizachne purpurascens (Torr.) Swallen
Selaginella rupestris (L.) Spring
Smilacina stellata (L.) Desf.
Smilacina trifolia (L.) Desf.
Solidago canadensis L.
Solidago decumbens Greene var. oreophila (Rydb.) Fern.
Solidago hispida Muhl.
Spiranthes lacera Raf.
Streptopus amplexifolius (L.) DC.
Taraxicum officinale Weber var. americanus Schultes
Thalictrum dasycarpum Fisch. & Lall.
Thalictrum venulosum Trel.
Tofieldia glutinosa (Michx.) Pers.
Trientalis borealis Raf.
Trillium cernuum L
Urtica dioica L. var.procera Wedd.
Vaccinium vitis-idaea L. var. minus Lodd.
Vicia americana Muhl.
Viola nephrophylla Greene
Viola renifolia Gray
Zygadenus elegans Pursh

MOSSES

Brachythecium plumosum (Hedw.) BSG
Brachythecium populeum (Hedw.) BSG
Brachythecium reflexum (Starke ex Web. & Mohr) BSG
Brachythecium rutabulum (Hedw.) BSG
Brachythecium salebrosum (Web. & Mohr) BSG
Calliergon cordifolium (Hedw.) Kindb.
Ceratodon purpureus (Hedw.) Brid.
Climacium dendroides Web. & Mohr
Dicranum flagellare Hedw.
Dicranum fuscescens Turn.
Dicranum polysetum Sw.
Dicranum scoparium Hedw.
Drepanocladus uncinatus (Hedw.) Warnst.
Eurhynchium pulchellum (Hedw.) Jenn.
Hylocomium splendens (Hedw.) B.S.G.
Plagiomnium drummondii Bruch & Schimp.
Pleurizium schreberi (Brid.) Mitt.

MOSSES (Cont'd)

Pohlia nutans (Hedw.) Lindb.
Polytrichum commune Hedw.
Polytrichum juniperinum Hedw.
Polytrichum strictum Brid.
Ptilium crista-castrensis (Hedw.) De Not.
Rhizomnium pseudopunctatum (Bruch & Schimp.) Kop.
Rhytidiadelphus triquetrus (Hedw.) Warnst.
Sphagnum fuscum (Schimp.) Klinggr.
Sphagnum magellanicum Brid.
Sphagnum nemoreum Scop.
Sphagnum warnstorfii Russ.
Splachnum sp.
Thuidium abietinum (Hedw.) B.S.G.
Thuidium recognitum (Hedw.) Lindb.
Tomenthypnum nitens (Hedw.) Loeske

LICHENS

Cladonia mitis Sandst.
Cladonia rangiferina (L.) Wigg.
Cladonia cristatella Tuck.
Cladonia furcata (Huds.) Schrad.
Cladonia gracilis (L.) Willd.
Peltigera apthosa (L.) Willd.
Peltigera canina (L.) Willd.
Peltigera polydactyla (Neck.) Hoffm.